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ABSTRACT

Recognizing that many families might be unaware that their home may contain lead hazards, the United States Environmental Protection Agency Region 5 issued a grant to the University of Illinois-Chicago to develop a model curriculum for junior high school students on the risks of lead in the home and environment. This integrated seven-lesson unit of study allows teachers to incorporate special topics into existing curriculum units. Each lesson is designed to be used individually. The lessons are: (1) "The Leading Role of Lead," concerning the qualities of lead; (2) "LEADing the Way," presenting information on a history of the uses of lead; (3) "Lead Flakes," demonstrating that water can contain lead; (4) "Don't Be a Leadbelly," concerning where lead is stored in the body and where it can do damage; (5) "Getting the Lead Out!," making students familiar with lead abatement procedures and allowing students to survey their homes; (6) "Family Lead Alert: Students as Teachers," in which students profile their families to determine if their nutritional practices prevent unnecessary lead absorption; and (7) "LEADing Questions," incorporating creative problem solving regarding lead in the environment. Each lesson includes learning objectives, an introductory statement, a list of necessary materials, management suggestions, procedural instructions, safety concerns (if necessary), extension suggestions, and assessment ideas. "The Lead Detectors," a radio script and audiotape intended to be listened to or performed by middle school students (with accompanying poster) is provided as a companion to the curriculum. The play's radio mystery format allows students to perform without scenery, props, costumes, or line memorization. (Contains 32 references.) (KB)

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Let's Get the Lead Out

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- Bartlett M.S.....Bartlett, IL
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- Carleton-Washburn M.S.....Winnetka, IL
- Caruso Jr. High.....Deerfield, IL
- Circle Center M.S.....Yorkville, IL
- Clinton-Rossette M.S.....DeKalb, IL
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- Edison M.S.....Champaign, IL
- Frances Xavier M.S.....Chicago, IL
- Grant M.S.....Fairview Hts., IL
- Mokena Jr. High School.....Mokena, IL
- Murphysboro M.S.....Murphysboro, IL
- Palos South M.S.....Palos Park, IL
- San Miguel Center.....Chicago, IL
- Thurgood Marshal M.S.....Chicago, IL
- Wadsworth School.....Chicago, IL
- Washington Jr. High School.....Joliet, IL

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INTRODUCTION

The following unit about the dangers of lead in students' environment, in paint and in water in particular, is designed as a series of seven (7) lessons. Any one of these lessons may be used individually. Should the teacher choose to complete the entire unit, we recommend presenting the lessons in the order given so that the knowledge and understanding of the students build. If time is limited, Lesson 5, "Getting the Lead Out" is the most important and should always be taught. Please feel free to change, adapt, or modify according to students needs or preferences. We have also included a basic vocabulary list which the teacher can use in part or as a whole at any time during the unit, preferably before or after Lesson 1.

In attempting to sift through the large body of information about lead and its environmental problems, we tried to cull only those facts that we felt would be useful to the student in order to evaluate whether or not he/she is in an environmentally hazardous situation. We also tried to include the most basic of facts for the teacher. Every one of the information sheets may be reproduced or turned into an overhead.

The main thrust of this unit is that LEAD POISONING IS PREVENTABLE. We hope that, by educating the students about the potential hazards of lead in their environment, this unit will serve as a catalyst for more home/school, student/family, and school/family/community involvement in the problems lead has produced. Armed with basic facts about the possibility of lead in their water, in their painted surfaces, and in other areas of their environment, students may provide the impetus that will eradicate any need for future units such as this.

WORKING VOCABULARY

alloy	a substance that is a mixture of two or more metals.
chelation therapy	a medical treatment in which a drug which is attracted to metals (such as lead) is infused into a patient's vein. The drug binds to the metal in the blood and both are excreted by the kidneys as urine.
ductile	to be able to be hammer out thin or drawn out into wire without breaking
galena	PbS - a mineral compound of lead and sulfur; it is the principal ore of lead and often contains silver.
ingestion	the process of taking into the body as by swallowing; a way lead can enter the body.
inhalation	the process of breathing in through the nose and mouth; a way lead can enter the body.
litharge	a compound of lead and oxygen, [a fused lead monoxide broadly; lead monoxide] used for making storage batteries, glass and glaze on china.
malleable	able to be hammered, pressed, or beaten into various shapes without breaking
pewter	any of various alloys having tin as a chief component; a dull alloy with lead, formerly used for domestic materials.
pica	a craving to eat non-food substances, e.g., children often place leaden paint chips, crayons, cigarette ashes in their mouths.
red lead	Pb2O4 - a compound of lead and oxygen that plays an important role in paint that is used to protect steel structures, such as bridges, from rusting.
smelting	a method by which metals are taken from their original ore.
solder	a metal alloy used to join metal surfaces together.
tin	a white metallic element that people have used since ancient times.
toxic	a chemical is toxic if it damages living tissue, impairs the central nervous system, or causes birth defects, illness, or death when eaten, drunk, inhaled, or absorbed through skin.

LESSON 1

THE LEADING ROLE OF LEAD

LEARNING OBJECTIVES

The learner will be able to identiy the qualities of lead.

INTRODUCTORY STATEMENT

Lead has been used as early as 3800 B.C. by the Sumerians. Lead has been used for a wide variety of purposes and its unique qualities will be discussed here. Although more is known about lead's health hazards today than in the past, it is still used for many items today.

MATERIALS

- Items (gathered by teachers or students) that contain or have contained lead in the past (batteries, paint, crystal, cans, etc.)
- Overhead transparencies for notes
- Worksheet
- Almanac

MANAGEMENT SUGGESTIONS

- One class period/homework
- Pair students to work with almanac

PROCEDURE

- Place items on display for students to see.
- Ask students about what the items have in common.
- Use overhead to explain the qualities of lead
- Provide the "Leading Role of Lead" worksheets for completion.

EXTENSIONS

- Research lead smelting
- Research mining of ores

ASSESSMENT

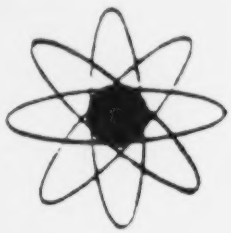
- Students will be able to identify five of nine physical properties of lead by creating an acronym or other mneumonic device.

QUALITIES OF LEAD

LEAD (LATIN PLUMBUM)

- symbol: Pb
- atomic number: 82
- atomic weight: 207.21
- specific gravity: 11.3 (slightly more than 11 times as heavy as water
- melting point: 327° C (low for metals)
- boiling point: 1740° C
- rarely occurs in elemental form
- chiefly obtained as an ore from the mineral
- occurs in combination with other metals especially silver and zinc

PHYSICAL PROPERTIES



- bluish-white or bluish-gray metal
- bright luster
- very soft, highly malleable
  - does not readily crack due to building, settling, etc.
  - does not burst with freezing and thawing
  - expands when water freezes
  - when it does burst, fractures can be temporarily repaired by mashing the leaking area
- ductile
- poor conductor of electricity (chemical reactions of lead and its oxides with sulfuric acid allows storage of electricity)
- very resistant to corrosion from air, sea water and many chemicals
- resists passage of noise, vibrations, and radiation
- stable
- **Highly Toxic**

LOCATION OF LEAD ORES

Lead ores are: anglesite ($PbSO_4$)
cerussite ($PbCO_3$)
minim (Pb_3O_4)
galena (PbS)

LOCATION OF U.S. SMELTING FACILITIES

Glover, Missouri
East Helena, Montana
Omaha, Nebraska

207

Pb

LEAD

82

Name _____

THE LEADING ROLE OF LEAD

Directions: Using the data below and a world map, make a colored map that shows where lead production is in the world AND where lead is smelted in the U.S.A.

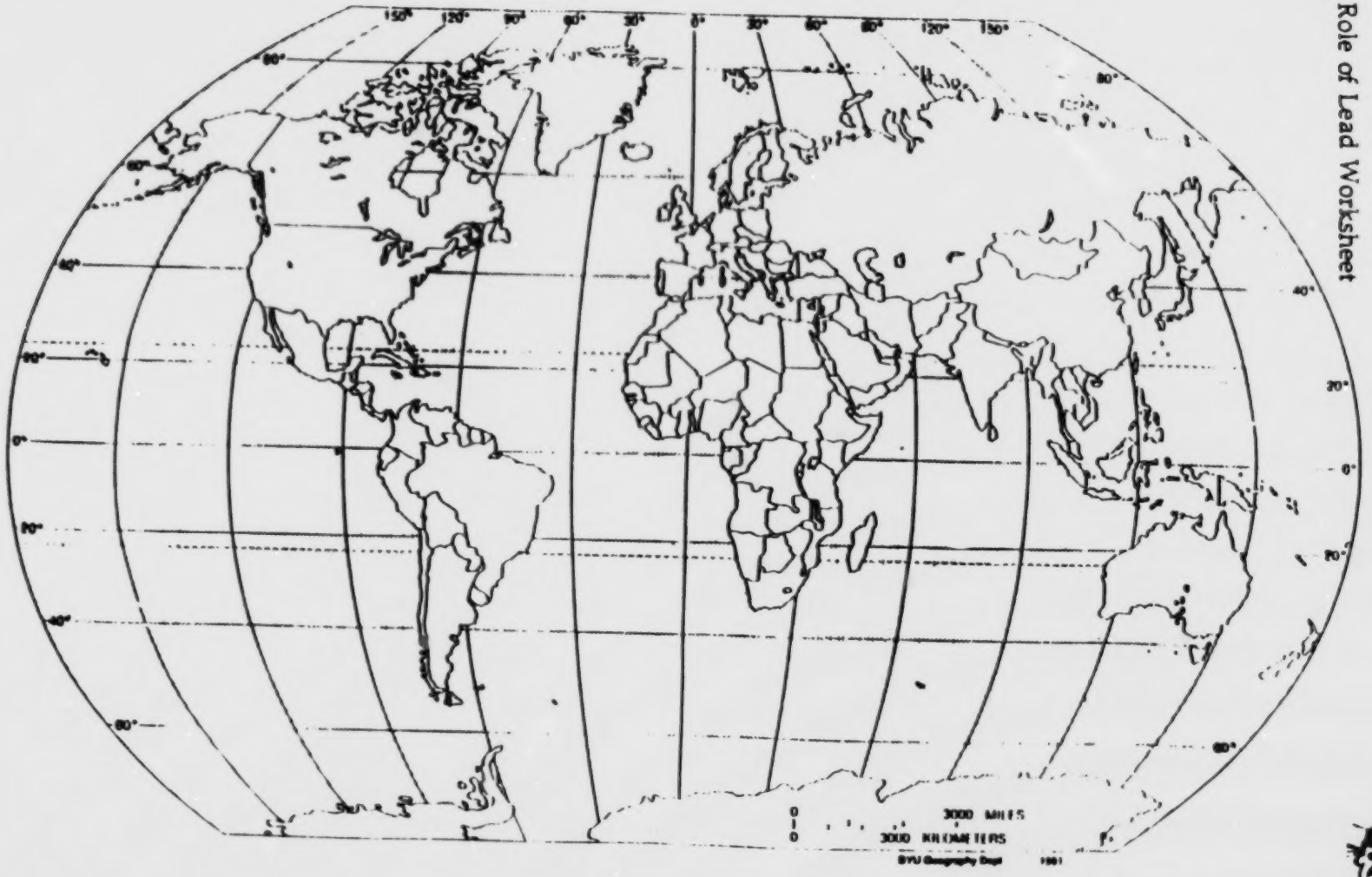
1. COLOR in BLUE the countries that have 0.0 - 95 thousands of metric tons of lead produced each year.
2. COLOR in RED the countries that have 96 - 510 thousands of metric tons of lead produced each year.
3. Place a BLACK dot on 3 areas where lead is smelted in the USA.

LEAD PRODUCTION (thousands of metric tons)

Country, Group, Region	Value	Rank
USSR (former)	510	1
Australia	495	2
United States of America	419	3
Canada	275	4
China	237	5
Peru	192	6
Mexico	164	7
Yugoslavia (former)	97	8
South Africa	95	9
Bulgaria	95	10
North Korea	90	11
Sweden	83	12
Spain	74	13
Morocco	61	14
Poland	49	15
Ireland	32	16
Romania	30	17
Namibia	29	18
India	27	19
Zambia	22	20
Japan	19	21
Brazil	17	22
Bolivia	17	23
South Korea	13	24
Iran	11	25
Chile	1	26
France	1	27

Name _____

Leading Role of Lead Worksheet
Page 2
Map



Leading Role of Lead Worksheet
Teacher Answer Key For Map

LESSON 2

LEADing THE WAY

LEARNING OBJECTIVES

The learner will become familiar with the basic background information that is necessary to understand the uses of lead today.

INTRODUCTORY STATEMENT

In this investigation, students will become familiar with a brief history of the uses of lead. After the students have learned some basic historical and geographical facts concerning lead, they will have the opportunity to choose from several activities to demonstrate their newly acquired knowledge.

MATERIALS

- Scenario overheads
- Overheads of history, time line, maps
- Blank worksheets to correspond to teacher overheads
- Pencils and colored pencils/crayons

MANAGEMENT SUGGESTIONS

- Students may work alone, in pairs, or in groups (in classrooms or resources center.)

- Three to four 45-minute periods should allow sufficient time for background information presentation, student organization of this material, and discussion of the uses of lead.

- The typical student will require at least one period to fill in the timeline on the history of lead. Discussion topics can either be given for homework or done in class.

PROCEDURE

- Present the following scenarios. Allow time for discussion of "guesses" about the problems of Tony, Maria, and Charley.

PROCEDURE, continued

- Tell them that they will be better able to understand these children's problems if they learn more about the dangers of lead and how it has been used. (You may wish to jump ahead for a few facts from Lessons 4,5, and 6 in order to hint more specifically about the dangers of lead.)

- Use the overhead titled "LEADing the Way, a Brief History of Lead." You may want to read it aloud to the students, study it by centuries, have them take notes from it, or use the following BLANK TIMELINE and have them fill it in as you present the basic information.

- The TIMELINE activity may be done individually or in pairs in class, as you speak, after your presentation, or as a homework assignment.

- Introduce the idea that many "things" can be both "good" and "bad" for us. Using the discussion sheet, "It's ELEMENTary," which you may duplicate for each student or turn into an overhead, let students discuss the "pros" and "cons" of each use. See discussion sheet for ideas.

- Direct students to choose ONE topic, investigate BOTH sides of the issue, but choose ONE side to present to the class. They may choose a poster, speech, skit, debate, but, if working in a group, the entire group should reach consensus, e.g., one person, pair, or group may decide that working with lead in stained glass is too dangerous, while another may conclude that the risks are preventable and minimal.

- Complete the "LEADing the Way" worksheet as a culminating activity.

DISCUSSION

- Why did people choose lead for such varied uses as stained glass and bullets?

- Do you think this timeline is complete? If not, where could you go for more information on the history of the uses of lead?

- Are there "good" and "bad" uses for lead?

DISCUSSION, continued

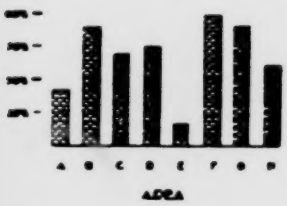
- Are you concerned that you may have environmental problems with lead where you live and/or go to school?
- Would you like to learn more about how lead can affect your health?
- Do you know if you have been exposed to lead?

EXTENSIONS

Social Studies (If above is done in science class)

- Students could use their timelines or any other information they have gathered to indicate on any world map where lead has been used.
- Students might research government regulations regarding lead. This might lead to a discussion about which countries have been the leaders in recognition and solution of the lead problem.
- Lead a class discussion on the question, "Could the Roman Empire Have Fallen Due to Lead?"

Math

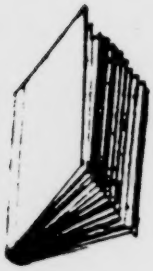


- Students could create graphs of countries currently mining lead and relate this mining to population/economy.
- Students could go home and count how many possible lead sources they have in their homes, then return to class, list the data and graph it, e.g., one class may have a high usage of lead sinkers, while another may have solder in old pipes.

Language Arts

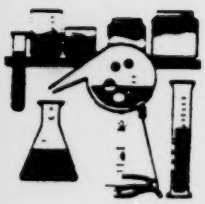
- Discussion of debating techniques could be done before presentation of the "pros" and "cons" activities.

EXTENSIONS, continued



Language Arts, continued

- Students could be taught how to write a paper which "takes a stand," a persuasive paper, e.g.,"Why Lead Should Remain in Stained Glass" or "Why Lead Should Be Eliminated From Fishing Sinkers."
- Students could write Acronyms for L.E.A.D., poems, or narratives.
- Students could create and enact skits about one part of the history of lead, e.g., the Greek and Roman usage of lead in counterfeit coins or about a current use of lead, e.g., lead used in colored newsprint.
- Students could write a story that rewrites a part of the history of lead, e.g., If everyone who used "pewter" became instantly ill and the connection was made between the lead content and their illnesses, would colonial Americans have used something else for dinnerware? What if lead bullets were so soft that they were like hitting the enemy with marshmallows?



Science (If the above was presented in social studies)

- Students can complete the worksheet on identifying lead products.

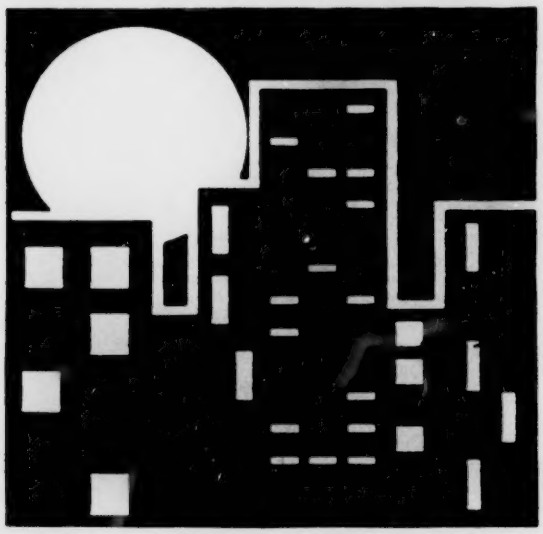
ASSESSMENT

- Using the timeline, students will create five questions (with answers) that indicate an understanding of major events on the timeline.

SCENARIO #1

Tony lives in a third-floor walk-up apartment in Big City, USA. A sixth-grade student at Central M.S., Tony was on the Honor Roll, won the spelling bee, and enjoyed working with younger children at the local Y after school. His mom was also able to count on him to do chores around the house such as taking out the garbage and helping babysit his younger brother. Tony was also a health fanatic, and he made sure he drank 6-8 glasses of water a day.

Lately, however, Tony's mom feels as if a new kid is living with her. Tony's grades have dropped, he can't seem to memorize any vocabulary or spelling, and he claims he's too tired to help at the Y. He's very cranky and irritable and seems so lethargic that his mom is afraid to leave him in charge of his younger brother. She's noticed this decline over a period of weeks, but she can't think of a cause for it. He should be happy. His bedroom was redecorated to his taste with all the icky paint being scraped away and bright colors now covering his walls. What's his problem?



SCENARIO #2

Maria had a bright future. Living in Heartland, USA, she was a star forward on the 8th grade girls' basketball team at North M.S., and the high school coach was already coming to her games. Her present coach counted on her to be a leader and a calming influence during tense moments on the court. At home, her parents liked her positive attitude and willingness to help, especially during recent renovations of the old farmhouse where they lived. She insisted on sanding down the beautiful old woodwork, so that her dad could stain and varnish it instead of having to look at that white paint her grandpa had used on the wood. Maria worked so hard that she had scraped knuckles, but she loved the results.

Recently, however, everyone is observing changes in Maria. She explodes at other players and referees on the court. During one game, she had severe pain in her joints and had to be benched. Her mom has noticed frequent vomiting, but can't tie that in to any particular food Maria has eaten. Maria's potential basketball career seems to be in jeopardy. What's her problem?

SCENARIO #3

John Martin and his wife, Clara, had two wonderful sons. Joe, age 10, born in a spanking new apartment complex, was an ideal child who gave them few problems and according to the parenting books, did exactly what he should do at exactly the age he should do it. When Joe was 6, the Martins were forced to move to another building, so John would be closer to his new job. Clara was expecting their second child at the time of the move.

The new building was not so nice. It was older and the walls had cracked paint and peeling wallpaper. Charley was born, and John and Clara Martin enjoyed weekends at home watching their two sons play. During the winters the children would play inside. During the warmer months, the children would play outside in the dirt lot near the highway. Charley was quite a handful. He was into everything and would put anything he could grab into his mouth – shoes, Joe's comic books, paint chips, wall paper, dust-balls and dirt. He would spend hours chewing on the window ledges or the bars of his crib.

As Charley grew, however, they noticed that he didn't develop quite as "on schedule" as Joe had done. He walked at a later age, had difficulty with basic letters and numbers, couldn't seem to remember words, and, in general, was having learning difficulties once he reached school. One doctor thought he was a slow learner, another diagnosed him as having ADD (Attention Deficit Disorder). The parents didn't know what to believe? They had raised their children with the same love. What is Charley's problem?

LEADing THE WAY

(A Brief History of Lead)

3800 B.C. - Sumerians mined lead

Pre-Bronze Age (3500 B.C.) - Many ancient civilizations valued lead for its qualities of heaviness and coldness. It was also used in association with death and was found in urns (ossuaries), coffins, curse tablets, and bas reliefs on tombs.

3000 B.C. - Lead pigment was used on many ancient buildings to preserve the long life of the color.

1700 B.C. - Ancient Babylonians used sheets of lead as flooring to hold moisture for plants.

1300 B.C. - 150 A.D. - Ancient Greeks and Romans used lead in their superstitious beliefs, e.g., Greeks believed lead bands placed on pomegranate trees would make the trees bloom. Lead was used by Roman doctors in body lotions for a cooling effect on the skin. Ancient Near Eastern folk used lead sinkers and plummets for fish nets, while the Phoenicians used lead anchors, and the Greeks had lead-tipped oars. They, too, used lead anchors, wooden pipes filled with the metal which could be removed and replaced with booty after a conquest.

500 B.C. - 50 B.C. - Many ancient civilizations begans using lead in coins. The Greeks and Romans also used it to create counterfeit coins by using lead as a center covered with a thin coating of gold or silver plating. The use of illegal leaded dice began around this time.

500 B.C. - Many civilizations used lead bullets instead of rocks in their slings. Molten lead was also poured on or catapulted toward one's enemies.

100 B.C. - Ancient India included red lead in cosmetics and as a medical cure for indigestion in addition to using this heavy, dull metal in weaver's weights and charms. Egyptians used lead in pottery glazes, soldering, amulets, and figurines.

20 B.C. - One of the best Roman aqueducts in Lyons was made of lead. This element enabled the Romans to develop their system of bringing water to most cities via aqueducts.

1220 - 1800 A.D. - In this "Pewter Era," a dull silver-gray alloy of tin with brass, copper, or, especially, lead was heavily used in items such a goblets and plateware.

1300 A.D. - Throughout Europe (in Germany and England, in particular) gunpowder was used to propel lead balls from cannons. Modifications of various firearms revealed a need to become technologically superior, and lead became valuable as European families struggled over territory.

1300-1500 A.D. - Lead was used for marking and drawing.

1500 A.D. - Europeans invented a rifle with a grooved barrel so a lead bullet could travel in a straight line.

1600 - 1700 A.D. - Lead weaponry was brought to the United States. Lead was also mined here, particularly in New York, Missouri, and Illinois (Galena).

1656 A.D. - Lead-free pewter came into use.

1673-1674 A.D. - North American Indian tribes such as the Sauk and Fox had been using their own methods for smelting lead. The report of French explorers, Marquette and Joliet, advanced the reputation of the lead region along the Upper Mississippi. This inspired other men like Pierre Charles LeSueur to form expeditions to find lead and other valuable minerals. Towns grew based on this mineral, e.g., Leadville, Colorado.

Late 1700's - Graphite replaces lead as a marking device.

1810 A.D. - Using lead as solder, the tin can makers introduced this item of convenience.

1840 A.D. - France discouraged the use of lead in paint.

1870 A.D. - Germany banned the use of lead in paint.

1904 A.D. - Australia joined the banning of lead in paint.

1920's A.D. - Lead was used as an additive in gasoline.

1945 A.D. - Cans that were almost 98% lead were made in the U.S. due to tin shortage in World War II.

Post WWII - Uses of lead expanded, e.g., in pesticides.

1970 A.D. - Clean Air Act stated that the addition of catalytic converters to vehicles to reduce air pollution would require the use of unleaded gas.

1977 A.D. - Consumer Product Safety Commission limited lead content to 0.6% in residential paint applications.

1978 A.D. - United States Department of Housing and Urban Development (HUD) says the residential use of lead-based paint is prohibited in the USA.

1986 A.D. - Congress amended the Safe Drinking Water Act to prohibit the use of lead in public water systems.

1992 A.D. - The Preventive Health Amendment reauthorized the Center for Disease Control and Prevention to make grants to state and local agencies to screen children for elevated blood lead levels.

1992 A.D. - The Residential Lead-Based Paint Hazard Reduction Act states the prospective home buyer will be notified of possible existence of lead hazards and given ten days from time of contract signing to conduct a lead inspection. This act also requires the Environmental Protection Agency to determine health-based standards for lead in soil, dust, and paint.

1994 A.D. - Lead mined in only 4 states: Missouri, Arkansas, Colorado, Idaho.

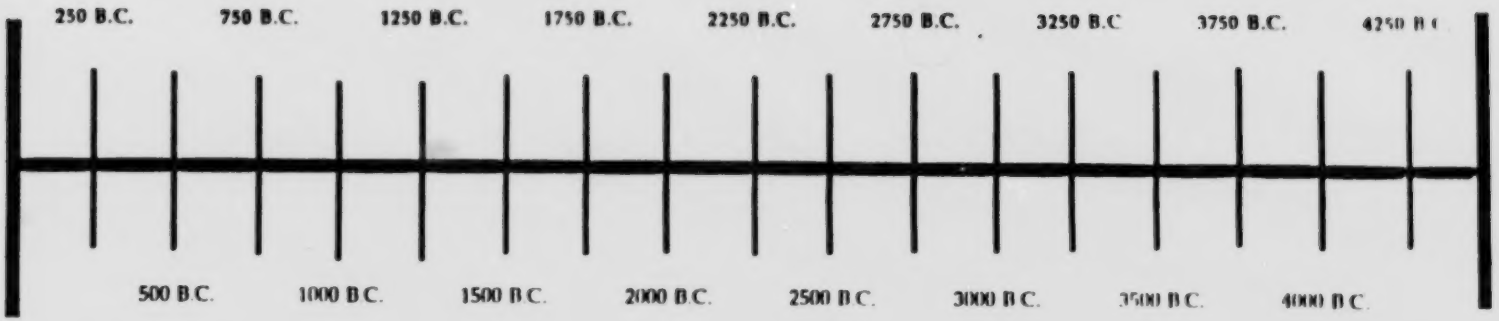
1994 - Future - Young scientists continue to research the helpful and harmful uses of lead.

To the Teacher:

The History of Lead Timeline exercise may be done by students individually and/or as a class. As a group exercise, teachers should create overhead transparencies of the blank Answers Keys (pages 21 and 23) filling in the timeline as students identify the correct information.

Name _____

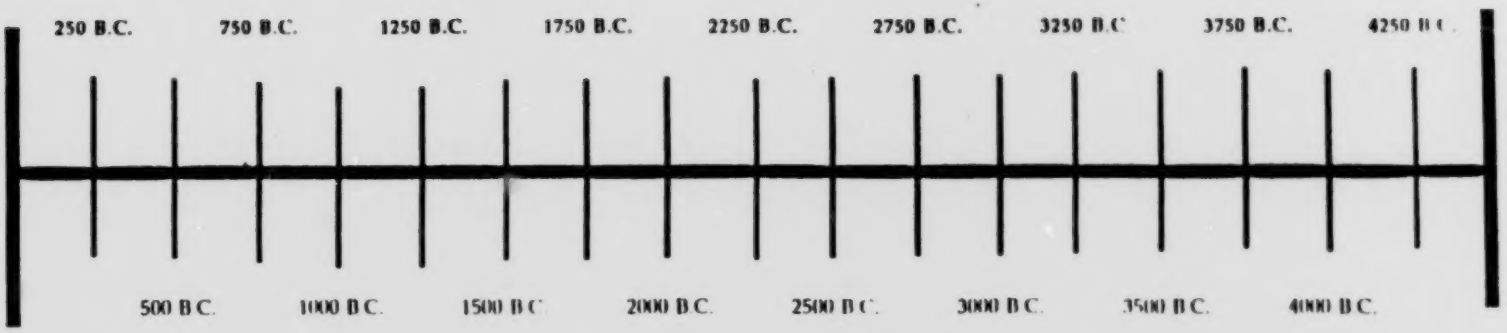
THE HISTORY OF LEAD TIMELINE (B.C.)



OVERHEAD

THE HISTORY OF LEAD TIMELINE (B.C.)

ANSWER KEY



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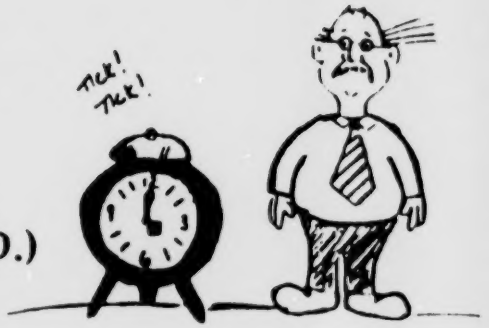
Name _____

THE HISTORY OF LEAD TIMELINE (A.D.)



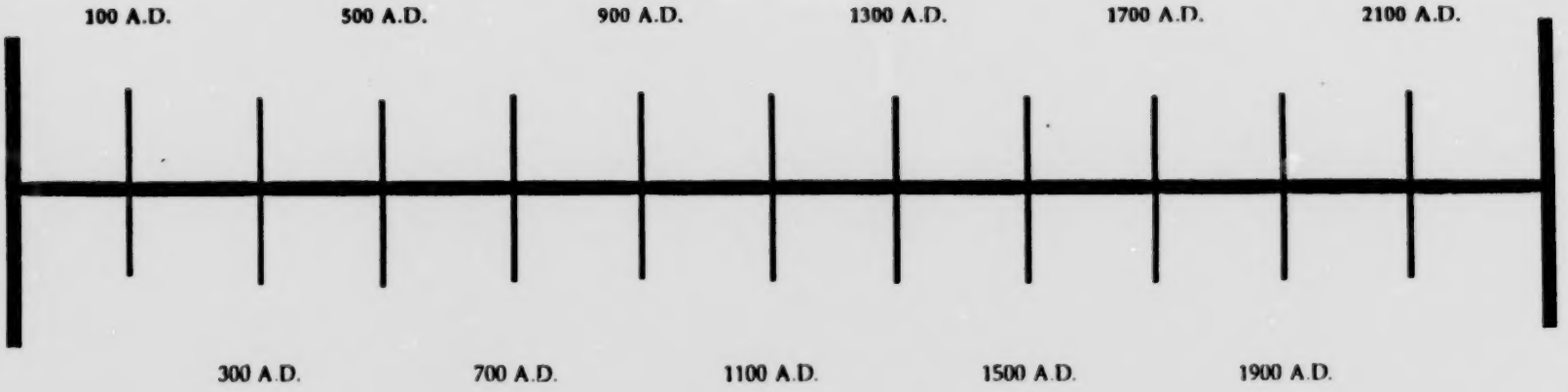
100 A.D. 500 A.D. 900 A.D. 1300 A.D. 1700 A.D. 2100 A.D.

300 A.D. 700 A.D. 1100 A.D. 1500 A.D. 1900 A.D.

OVERHEAD

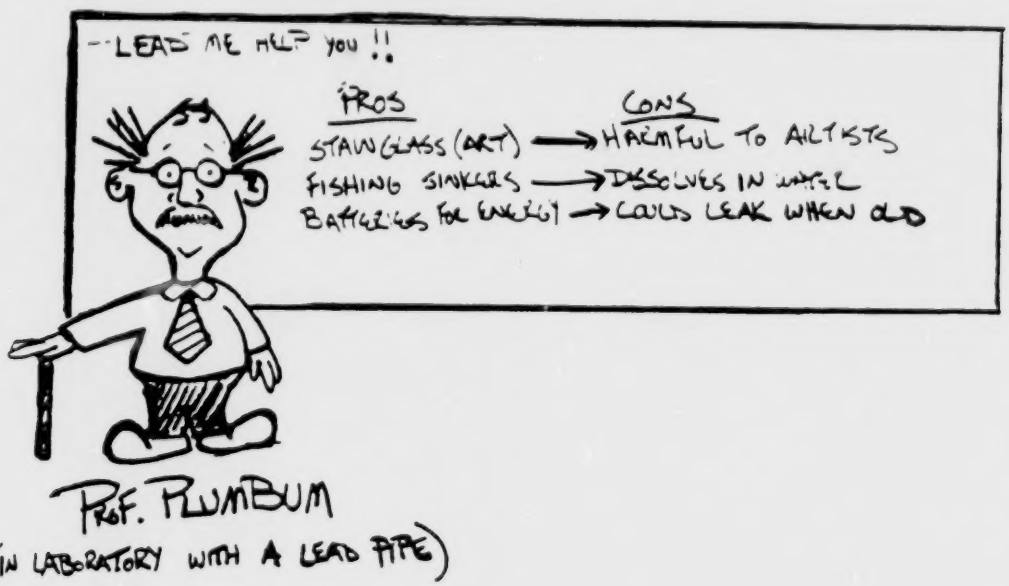
THE HISTORY OF LEAD TIMELINE (A.D.)

ANSWER KEY



IT'S ELEMENTARY

In this age of environmental awareness, a modern dilemma arises. Some argue that lead is one of our more important natural resources; others note it can be one of the most hazardous chemical elements. A brief discussion of the helpful and harmful roles lead can play in our lives may help us reach a reasonable balance, at least of understanding, if not of use. Each of the following uses of lead can be researched by individuals or in cooperative groups. There are "pros" and "cons" of each use. Students can use research results for debates, discussions, or speeches, e.g., the lead used in stained glass creates an object of art yet the same lead can be harmful to the stained glass maker; lead sinkers create a needed weight on a line for a fisherman which, in some societies can mean the difference between eating and starvation, yet a cut fishing line will cause the lead to sink and eventually dissolve in the water, harming wildlife and humans.


--LEAD ME HELP YOU !!
PROS
CONS
STAINGLASS (ART) → HARMFUL TO ARTISTS
FISHING SINKERS → DISSOLVES IN WATER
BATTERIES FOR ENERGY → COULD LEAK WHEN OLD
PROF. PLUMBUM
(IN LABORATORY WITH A LEAD PIPE)

Name _____

Food for Thought
(Topics to investigate and discuss)

1. lead shields for hazardous work in areas such as X-ray technology and nuclear equipment
2. lead crystal
3. stained glass
4. solder
5. electric storage batteries
6. drainpipes
7. covers for power and phone cables
8. sinkers for fishing
9. bullets
10. shot

11. weights to balance airplane propellers and automobile wheels
12. linings in equipment that uses corrosive materials such as acid
13. lead used in combinations as in PbCO3 (lead used with calcium in roofing materials and maintenance-free batteries) or with other alloys in products such as bearings and type for printing
14. lead as an addition to plywood, plastic or plasterboard to make building materials that will control noise and vibration
15. lead used with arsenic to create pesticide
16. litharge, which is lead and oxygen, used as a glaze on china and in storage batteries
17. red lead - a lead/oxygen compound used in paint on steel structures (as in bridges) to prevent rust
18. foreign-made cans - some still use lead as a "joining" material
19. lead used in ink on some containers, e.g., food storage bags
20. lead used in the ink of colored newsprint

NATIONAL LEAD INFORMATION CENTER

Is there lead in food cans and wrappers?

The Food and Drug Administration (FDA) has worked with industry to lower lead levels in food-contact materials. U.S. food canners no longer use lead-soldered cans for food products.

Lead is still used to seal some imported cans, however, One-piece aluminum cans, like those used for soft drinks, have no seams and therefore contain no solder. Cans with welded seams, which form straight, flat lines, are also lead free. Consumers are advised not to store foods in opened cans.

Some food packaging materials, such as bags, may have ink that contains lead on them. Consumers are therefore advised not to reuse food packaging material with ink on it.

Do dishes or ceramic ware contain lead?

Since 1970, FDA has had limits on lead and cadmium in ceramic ware products. The limits were lowered in 1980 and again in 1991 to reduce consumer exposure to lead in food from ceramic dishes that may have lead glazes. Most ceramic ware items sold in the United States meed current FDA limits because manufacturers tightly control the way they make dishes to minimize the potential for lead to leach into food.

Suspect ceramic ware products entering the United States from other countries can be automatically held at Customs until the importer or distributor can prove that the products meet FDA requirements. Sometimes, however, individuals bring ceramic ware items into the United States in personal baggage. These items may not be closely examined when they enter they country and may have a lead glaze or decoration that can allow high levels of lead to get into food.

Ceramics made by craftspeople in the United States may pose a risk because of uneven quality control or the firing practice used.

To avoid possible exposure to lead from ceramics and other tableware, consumers should take the following precautions:

- Do not store food in any dishes that may contain lead.
- Do not store food in antiques or collectibles.

Do dishes or ceramic ware contain lead, cont.

- Be wary of using or of storing food or beverages in highly decorated or metallic-coated tableware, particularly items made in other countries or by amateurs and hobbyists.

- Pregnant women should limit their use of lead-glazed mugs or cups for hot beverages, since lead is harmful to fetuses.

Is there a way to find out if my dishes contain lead?

Many manufacturers of tableware maintain toll-free telephone numbers for consumers who have questions about their product to call. To obtain one of these phone numbers, consumers should call the "800 number" information operator at 800-555-1212.

Do-it-yourself test kits are commercially available. These kits do not indicate how much lead is present, however, and their reliability at detecting low levels of lead has not been determined.

Does glass or crystal ware contain lead?

Glass ware does not contain lead, but lead is used to make the more expensive lead crystal. People who have lead crystal items should take the following precautions:

- Do not store liquids in crystal glasses or bottles.

- Do not drink from lead crystal on a daily basis, especially if you are pregnant.

- Do not feed an infant or child from a lead crystal baby bottle or cup.

Do the capsules on wine bottles contain lead?

The capsules, or foil wraps, on many wine bottles do contain lead, which can be deposited on the rims or lips of bottles and transmitted to the wine when it is poured. To prevent this from happening, consumers should always wipe off the tops and rims of wine bottles after they are opened.

Is there lead in colored newspaper?

Some colored inks, including those used on newsprint, contain lead. To avoid exposure to lead from colored newspaper, children should wash their hands after they have touched comics or comic books (colored newsprint). Do not let infants or children chew on colored newsprint.

Do cosmetics contain lead?

Cosmetic products made in foreign countries may have high lead content -- for example, eye shadows made in India. Cosmetics sold in the United States are required to be safe and to list ingredients on the label. Lead acetate has been demonstrated as safe for use in hair dye. Always read the list of ingredients on the label when choosing cosmetic products.

Is there lead in home remedies?

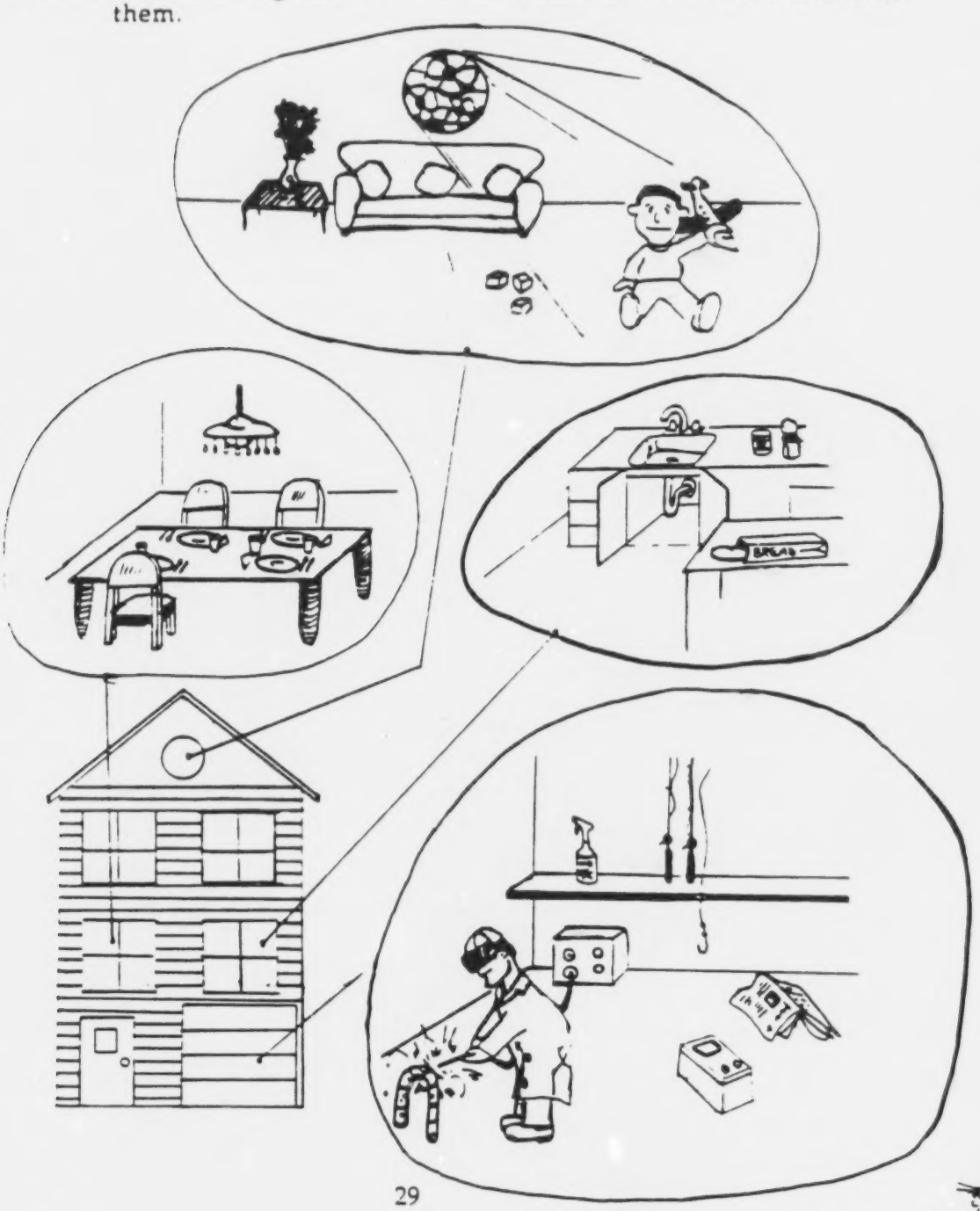
Many "non-Western" medicines (for example, greta and azarcon, which some people use to treat diarrhea or gastrointestinal upset) contain substantial quantities of lead. Other folk remedies that contain lead include alarcon, alkohl, azarcon, bali goli, coral, ghasard, greta, ligs, pay-loo-ah, and rueds.

Make sure you know exactly what is in a home remedy before taking it or giving it to a child. Taking lead, even a little bit, is always harmful.

Name _____

LEADing THE WAY

DIRECTIONS: In the drawing below, find the 11 items that contain lead and circle them.



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Answer Key

LEADing THE WAY

DIRECTIONS: In the drawing below, find the 11 items that contain lead and circle them.

Stained Glass

Storage Battery

Sinker for Fishing

Pesticide

China

Cans

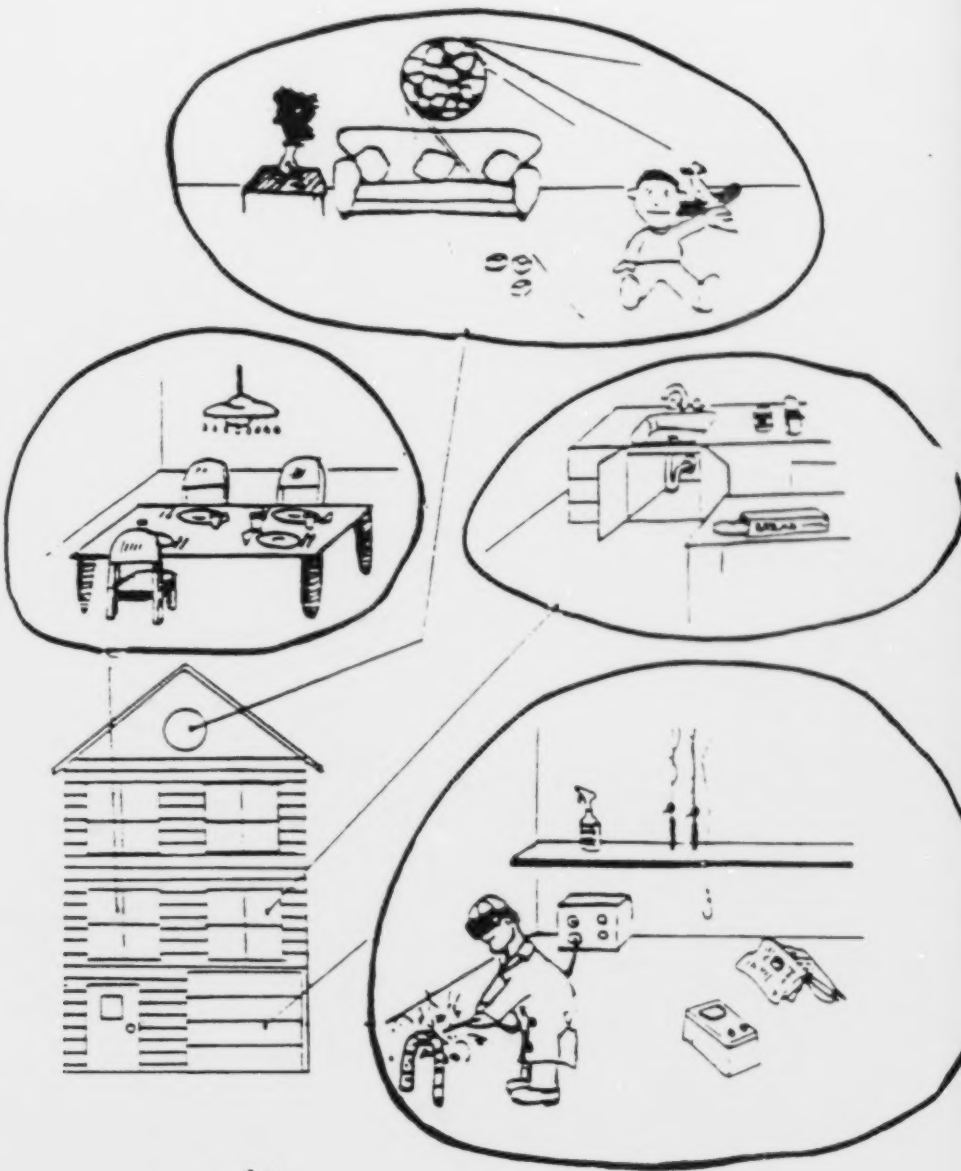
Lead pipe

Crystal

Solder (guy welding)

Newspaper

Bread Bag



Name _____

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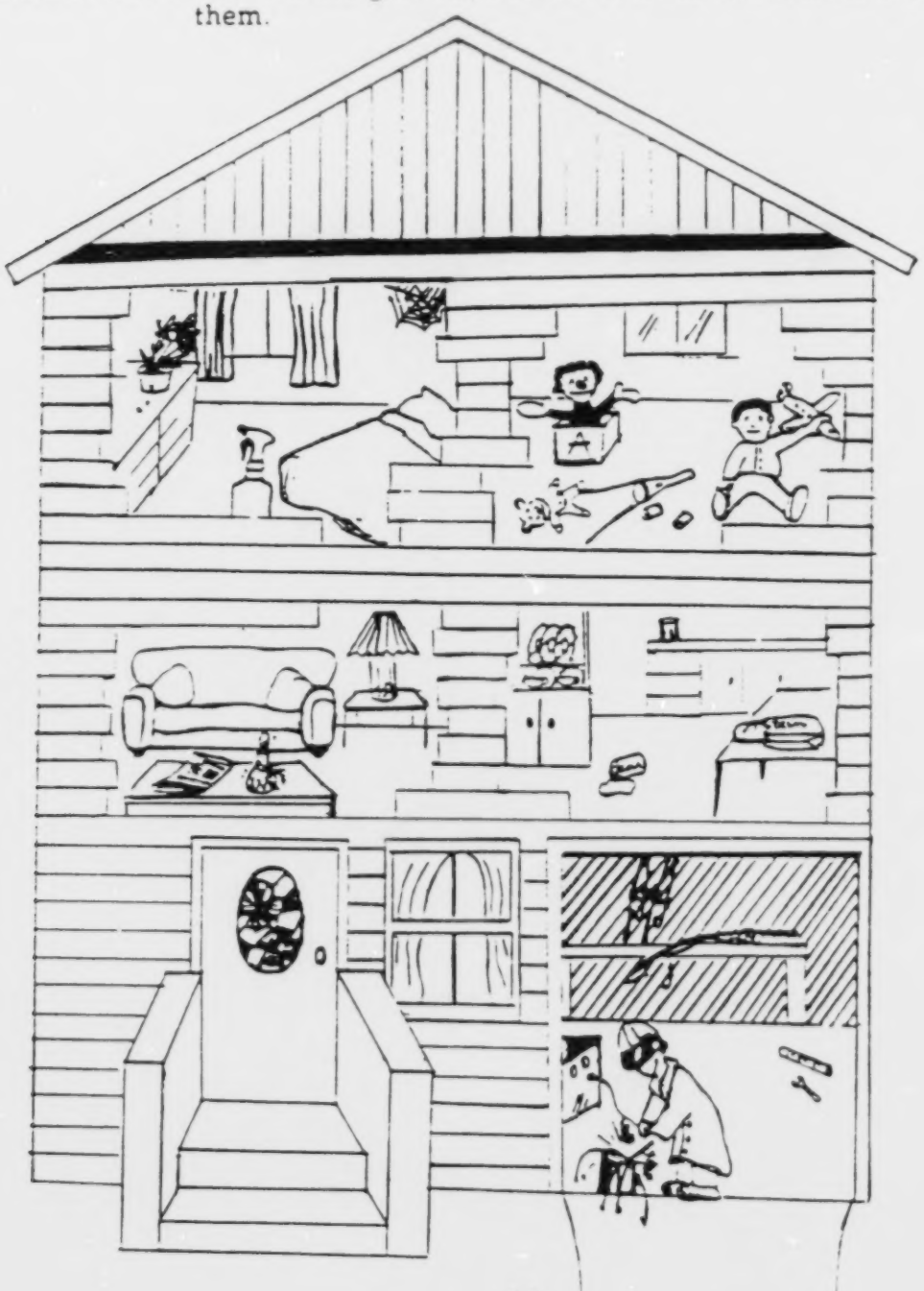

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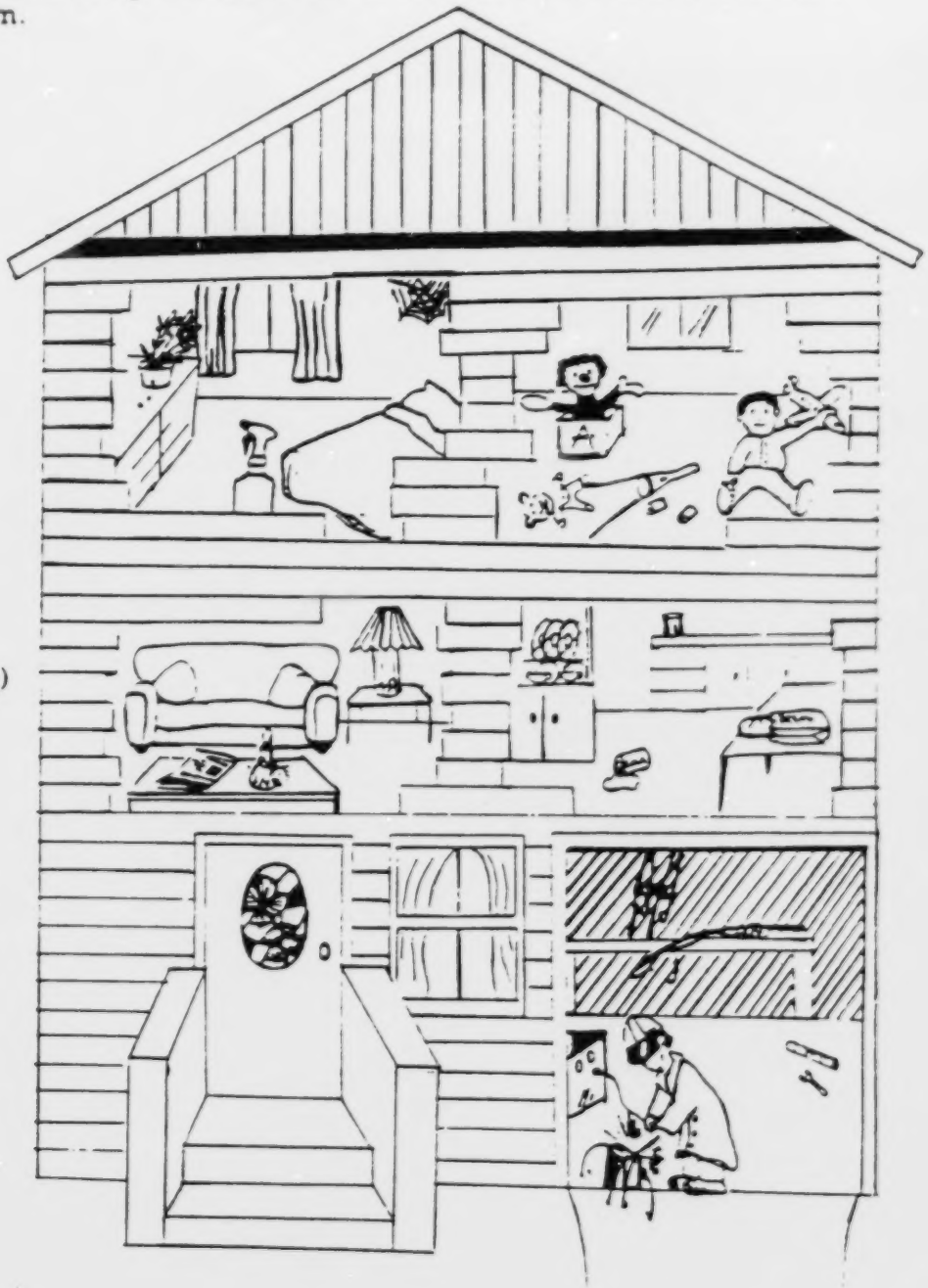


LESSON 3

LEAD FLAKES

LEARNING OBJECTIVES

The learner will discover that water can contain lead.

INTRODUCTORY STATEMENT

Lead has been used as a solder for copper pipes in plumbing systems. As the lead corrodes, it contaminates the water supply and poses serious health risks. **The corrosion of lead solder is the major cause of lead contamination of drinking water today;** however, other sources of lead exist like brass water pumps. All schools are required by law to test the level of lead in their drinking water. The maximum level of contaminant permitted in water delivered in a public water system is 5 ppb.

MATERIALS

- 0.1 M solution of potassium iodide (KI)
- Sources of water (i.e. pond water, school drinking water, residential water)
- Goggles
- Eyedropper
- Test tube
- Beakers
- Microscopes
- Lead sinker
- dilute nitric acid

MANAGEMENT SUGGESTIONS

- This activity, designed as a teacher demonstration, may be appropriate only for upper grades.
- If the water does not contain lead, the teacher can make a solution with a lead sinker and dilute nitric acid.
- If the teacher prefers to demonstrae a yellow precipitate with KI, use Pb (NO3)2 in solution, KI +Pb(NO3)2 --->. KNO3 + PbI v
- One class period

SAFETY CONCERNS

- Use goggles

PROCEDURE

- Take the water samples and boil them down to increase the concentration of the lead in the solution.
- Let the solution cool.
- Place the solution in a test tube.
- Add a few drops of KI to the lead solution.
- Observe. If lead is present, a yellow precipitate will form. (This can be seen under a microscope.)
- Complete the data table.

EXTENSIONS

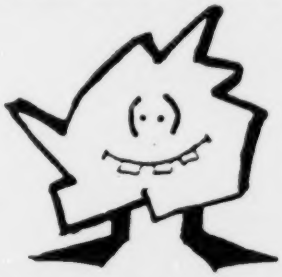
- Talk to your maintenance men/women to find out the lead levels for each water faucet in your building. Map out the drinking water faucets in your building on a school map. Next to each faucet, write the lead level.
- Talk to your city/county water suppliers about lead levels.
- Talk to makers of water purification systems for the home.
- Make posters for each water faucet in your building. Each poster can show ways to keep lead levels low (let water run for one minute, etc.) Make signs that represent lead-free drinking areas, etc.
- Class could hypothesize answers for "Developing A Plumbing Profile of Your School."
- Small group of students could complete "Developing a Plumbing Profile of Your School."
- Compare hypothesis to facts for "Developing a Plumbing Profile."

ASSESSMENT

- Students will complete the Lead Flakes Lab report.

Name _____

LEAD FLAKES LAB DEMONSTRATION



PURPOSE

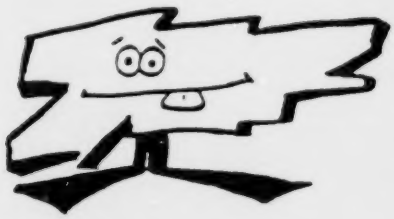
Can lead be found in water?

HYPOTHESIS

Which water sources contain lead?

PROCEDURE

- Take the water samples and boil them down to increase the concentration of the lead in the solution.
- Let the solution cool.
- Place the solution in a test tube.
- Add a few drops of KI to the lead solution.
- Observe. If lead is present, a yellow precipitate will form. (This can be seen under a microscope.)
- Complete the data table.



RESULTS

WATER SOURCES AND LEAD

WATER SOURCE	OBSERVATIONS	PRECIPITATE YES OR NO

Name _____

LESSON 3

LEAD FLAKES LAB

QUESTIONS

1. What sources of water contain lead?

   _____

2. If your water did not yield a precipitate, does this automatically mean that there is no lead present in your water? Explain.

   _____

   _____

   _____

3. Do you know the lead levels in your drinking water? _____
   How can you get this information?

   _____

   _____

Name (s) _____

DEVELOPING A PLUMBING PROFILE OF YOUR SCHOOL

The following questionnaire will help you determine whether lead is likely to be a problem in your schools. It will also help you identify which locations have the highest risk of lead contamination. Copies of this questionnaire should be completed for each school within your district. The questions and their significance are discussed in depth on the following pages.

1. When was the school built? _____

2. After the construction of the original building, were any new building or additions added? If so, when? _____

   _____

3. If built since December, 1986, was lead-free plumbing and solder used in accordance with the lead ban? _____

4. When were the most recent plumbing repairs made? _____

5. What is the service connector made of? _____

6. Specifically, what are the pipes made of? (Note the locations.)

   copper _____ plastic _____

   galvanized metal _____ lead _____

   other _____ brass _____

7. What materials does the solder connecting the pipes in your system contain? (Note locations with lead solder.) _____

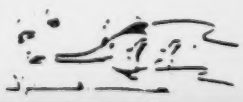
8. Are brass fittings, fixtures, faucets, or valves used in your drinking water system? _____

9. How many of the following outlets provide water for consumption? (Note their location.)

   water coolers _____ drinking fountains _____

   ice makers _____ kitchen faucets _____

TAKEN FROM: LEAD IN SCHOOL DRINKING WATER



10. What brands and models of water coolers provide water in your school?

_____

11. Do the faucets have accessible screens? _____

12. Have the screens been cleaned? _____

13. Can you detect signs of corrosion, such as frequent leaks, rust-colored water, or stained dishes or laundry? _____

14. Is any electrical equipment "grounded" to water pipes? (Note their location.) _____

15. Have there been complaints about bad (metallic) taste? _____

16. When were water samples from your building last tested for contaminants? _____

What kind of contaminants? _____ _____ _____ _____

Was lead found? _____

At what concentration? _____

What was the pH level? _____

Is testing done regularly? _____

17. Who supplies your school's drinking water? _____

A. If purchased, you should ask your supplier:
Does the water system have any lead piping? _____

How corrosive is the water? _____

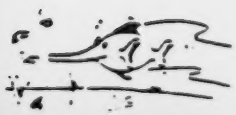
Is the water supply being treated now? _____

B. If the school supplies its own water, you should ask:
Is the water supply treated to reduce corrositivity? _____

If so, what type of treatment is used? _____

Is the water treated for any purpose other than corrosion control? _____

If so, for what? _____



LESSON 4

DON'T BE A LEADBELLY

LEARNING OBJECTIVES

The learner will discover where lead is stored *in the body* and where lead can do damage.

INTRODUCTORY STATEMENT

Lead, once it enters the bloodstream, through inhalation or ingestion, will readily move around to different organ systems. It can be stored in bone tissue for years, only to re-enter the circulatory system to do damage later. The main organ systems of damage are the blood-forming systems (circulatory and skeletal), excretory system (kidneys), reproductive system, and nervous system.

MATERIALS

- Notes from lecture or overheads
- Drawing of the body
- Pencil or colored pencils

MANAGEMENT SUGGESTIONS

- Four to five class periods
- CAUTION: Teacher should stress that these symptoms are not unique to lead poisoning.

PROCEDURE

- Lecture about the HEALTH HAZARDS OF LEAD.
- After reviewing notes on the HEALTH HAZARDS OF LEAD, students will pin point the places of lead storage and damage on a drawing of the human body.

DISCUSSION

- What role does the skeletal system play in lead storage?
- One symptom of lead poisoning is a low red blood cell count. Explain how lead lowers this blood cell count.

DISCUSSION, continued

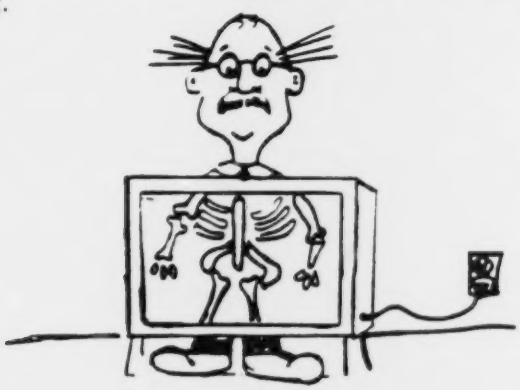
- Knowing the function of the kidneys, why would the kidneys be affected by lēad?
- Why are children most susceptible to lead poisoning?
- What are some ways to prevent lead absorption?
- What are some ways to reduce lead levels in the blood?
- How is the lead level in a human being tested?
- Are there any food items that will help keep lead from being absorbed into the body? What are they? How do these food items reduce lead absorption?

EXTENSIONS

- Talk to doctors about lead problems.
- Debate the pros and cons of requiring testing of lead levels in blood before admission to school.
- Students can write a letter to their family about how and where lead is stored and that testing can be done.

ASSESSMENT

- Students will be able to complete "DON'T BE A LEADBELLY" worksheet.



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HEALTH HAZARDS OF LEAD

What does toxic mean? "A chemical is toxic if it damages living tissue, impairs the central nervous system, or causes birth defects, illness, or death when eaten, drunk, inhaled, or absorbed through the skin," according to the EPA.

How much exposure to a chemical causes harm is determined by the chemical. The EPA states, "The amount needed to trigger a toxic reaction varies with the nature of the substance, the route of exposure, and the length of exposure. Acute toxicity refers to an exposure of short duration. Chronic toxicity refers to repeated or prolonged exposures-often in tiny doses -- to substances that in any single exposure could cause little or no harm." Certain chemicals are so toxic that they are measured in parts per million (ppm) or parts per billion (ppb). One ppb would be the equivalent to one pound of chemical in one billion pounds of soil!

Why are such small doses of some toxic chemicals hazardous? These chemicals are not only poisonous at low levels but they are extremely persistent; they do not break down easily and can remain in the environment for years! Prolonged exposure to these chemicals can cause health problems at a later date.

WHEN WAS LEAD FOUND TO BE TOXIC?

First account of acute lead poisoning was described 2000 years ago by the Greeks. In 1767, Ben Franklin determined that all the patients with certain symptoms in a Paris hospital had lead poisoning from their jobs. Some of their jobs included plumbing and painting. In 1915, the wives of painters using lead paint had a higher incidence of stillbirths and miscarriages.

Other nations in the 1920's and 1930's limited the use of lead in interior paints, the U.S. government did not. Until 1940, paint manufacturers either ignored or suppressed information that lead in paint was the cause of childhood poisonings. Researchers associated with the lead industry also played down the effects of lead on its workers.

The Clean Air Act of 1970 required the use of catalytic converters on cars which indirectly reduced the lead content in air. In the United States, residential use of lead-based paint was prohibited in 1978. In 1985, the U. S. Environmental Protection Agency ruled that the allowable lead content in gasoline had to be reduced from 1.1 grams per gallon to 0.1. The EPA also proposed a complete ban on use of lead in gasoline by 1988, but this did not happen. The Safe Drinking Water Act of 1975 set lead levels in drinking water at 15 ppb. This act was amended in 1986; the amendments banned the use of lead in the installation of any new public water system or the repair of existing water systems.

LEAD HAS NO HEALTH FUNCTION OR BENEFITS TO HUMANS!

WHAT IS LEAD POISONING?

Lead poisoning knows no age, race, geographic region, or socioeconomic level. It can affect anyone! An elevated blood-lead level can be found in any person who is exposed to lead; the amount of lead in one's blood system is determined by a blood-lead test. The Agency for Toxic Substance and Disease Registry defines the threshold level for lead poisoning in children at 10 - 15 micrograms per deciliter of blood (ug/dl); for adults, 25 ug/dl is the hazardous blood level limit according to the National Institute for Occupational Safety and Health (NIOSH).

HOW DOES LEAD ENTER THE BODY?

Common Sources of Exposure

* lead-based paint
* household dust (from deteriorating lead paint, repairing, remodeling, and repainting projects)
* soil (from leaded gasoline)
* drinking water (from lead solder around pipes)

Methods of Exposure

Ingestion:

* working/playing in dust and soil that contains lead and putting fingers/objects in one's mouth or not washing before eating
* eating flaking paint chips from deteriorated lead-based paint
* chewing on surfaces coated with lead-based paint, such as window sills or door edges.
* consuming folk remedies that contain lead
* eating food stored in lead-containing containers

"Pica" is the term used when children frequently place nonfood items in their mouths or swallow these small objects.

Inhalation:

* breathing in air that contains lead dust

WHAT HAPPENS TO LEAD IN THE BODY?

Once lead is absorbed by the gastrointestinal tract or lungs, it enters the circulatory system where it can readily move around. After several weeks, the lead leaves the bloodstream and is absorbed by bone tissue. Here, it can accumulate in higher concentrations with time. The units used to measure blood -lead levels are deciliters per microgram (dl/ug). Blood is measured in deciliters (dl) and lead is measured in micrograms (ug), making deciliters per microgram of lead (dl/ug). One microgram (ug) is 1/1,000,000 (one millionth) of a gram.

Lead has the ability to move about in the body from one organ to another during a lifetime, so one can be harmed by lead even though exposure has ended. Lead poisoning damages a number of organ systems including the blood-forming system, the kidney, the reproductive system, and the nervous system.

HEALTH EFFECTS ON ADULT LEAD POISONING

ACUTE (Short term)	CHRONIC (Long term)
- stomach cramps - irritability - fatigue - depression - headaches - loss of appetite - hard to concentrate - sleep problems - pains in muscle & joints - reproductive problems	Some effects are reversible, such as high blood pressure, but lead can cause permanent damage to: -- nervous system -- kidneys -- reproductive system

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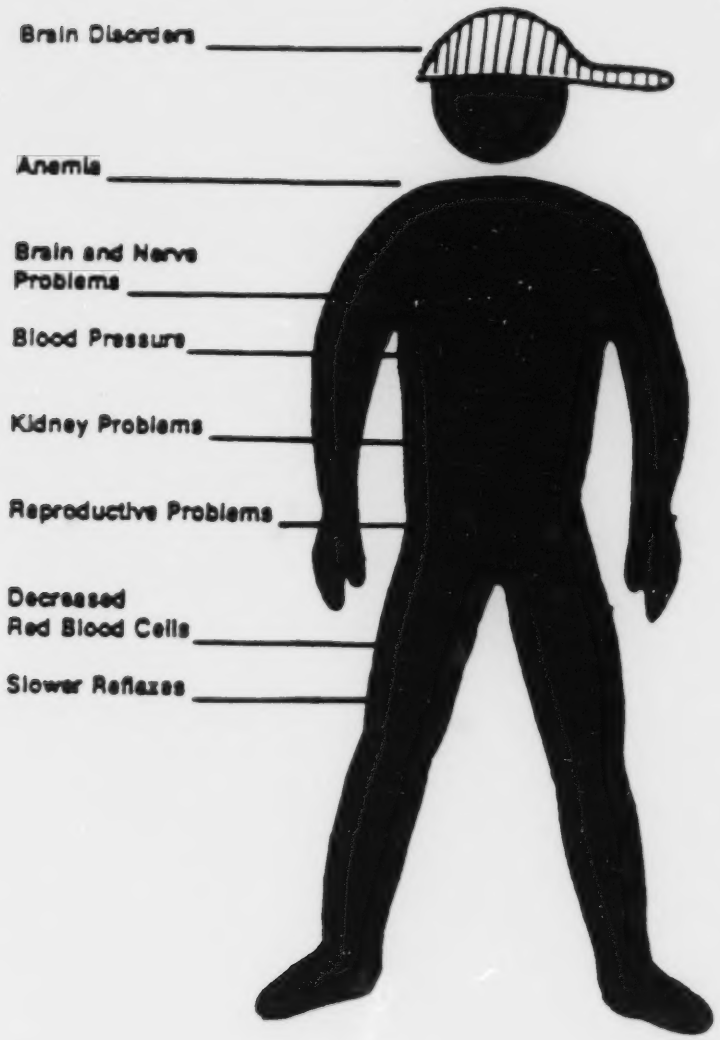
From *Health Effects of Lead*, OSHA

HEALTH EFFECTS OF LEAD IN ADULTS



THE BLOOD-FORMATION SYSTEM

Lead impairs the synthesis (formation) of a substance called "heme" which is extremely important to human life. Heme is the nonprotein part of the hemoglobin molecule that carries oxygen to the tissues of the body. Lead interferes with the formation of heme at several points, and can cause ANEMIA to develop. Pregnant women, women of child-bearing age, young children, and iron-deficient individuals are more susceptible to lead's interference in heme synthesis. The formation of red blood cells and the length of the life of a red blood cell can also be altered by lead.

THE KIDNEYS

High exposures to lead can damage the kidneys in both children and adults. One important function of the kidneys is to absorb certain substances which are filtered through the kidneys. Lead alters the metabolism of the kidneys thereby hindering its usefulness to the body. Once the lead is removed from the body, the kidneys will return to normal functioning, however, prolonged exposure or high lead levels in children may cause kidney problems later in adulthood.

THE NERVOUS SYSTEM

The effects of lead on the nervous system are becoming more understood. Earlier recommendations of "safe" blood lead levels were dangerously close to causing mental retardation. Over the last 20 years, the federal government has lowered the lead level in the blood from 80ug/dl to the present 10 ug/dl.

ADULTS

High levels (greater then 100ug/dl) of lead exposure in adults can cause "acute lead encephalopathy." This disease of the brain can occur suddenly and includes symptoms such as irritability, headaches, hallucinations, and dullness. Later, a person can start convulsing, become paralyzed, or die. A more typical picture of an adult with lead poisoning would show a person with diminished reflexes, "foot" or "wrist" drop (inability to maintain the hand or foot in a normal position due to weakness of muscle tone resulting from nerve damage), and other motor neuron problems.

At lower exposures, the peripheral nervous system is affected; however, these are usually asymptomatic. Individuals may have slowed movement of the nerve impulses, increased occurrence of fatigue, short-term memory loss, and decreased functioning of the nervous system for activities that require visual intelligence and visual-motor coordination.

CHILDREN

For high levels of lead exposure (100 to 150 ug/dl), encephalopathy results. The swelling of the brain causes pressure, limiting the brain's functions. Death is possible. Even if a child survives encephalopathy, he/she usually has brain damage in the form of mental retardation and severe behavioral disorders. Coma or convulsions are possible too.

Other effects of lead poisoning are of considerable concern, especially to a child's learning ability. Reduced intelligence, poor academic performance and impaired neurobehavioral development are associated with low blood-lead levels.

A fetus is also in danger of lead poisoning. Prenatal lead exposure, especially in the first trimester, can cause mental retardation and changes in the child's subsequent growth and development.

HEALTH EFFECTS OF LEAD ON CHILDREN AND THE FETUS

- **Neurobehavioral**
  - Decreased intelligence
  - Developmental delays
  - Behavioral disturbances
  - Seizures (at very high levels)
  - Coma (at very high levels)
- **Growth**
  - Decreased stature
- **Endocrinologic**
  - Altered vitamin D metabolism
- **Hematologic**
  - Elevated erythrocyte protoporphyrin levels
  - Anemia
- **On the fetus**
  - Decreased gestational weight
  - Decreased gestational age
  - Miscarriage and stillbirth (at very high levels)

Taken from Lead Abatement Training booklet, Midwest Environmental and Industrial Center, University of Illinois at Chicago, School of Public Health.

OTHER ORGAN SYSTEMS

Many other symptoms occur in children with low levels of lead poisoning like decreased stature of growth, decreased hearing acuity and decreased ability to maintain a steady posture.

Recently, concerns habe been raised about how lead affects the adult reproductive system.

POSSIBLE REPRODUCTIVE HEALTH EFFECTS OF LEAD

WOMEN	MEN
- decreased fertility	- decreased fertility
-miscarriages	-birth defects in offspring
-premature births	-problems having an erection
-stillbirths	-learning and behavioral problems
-learning and behavioral problems in offspring	in offspring

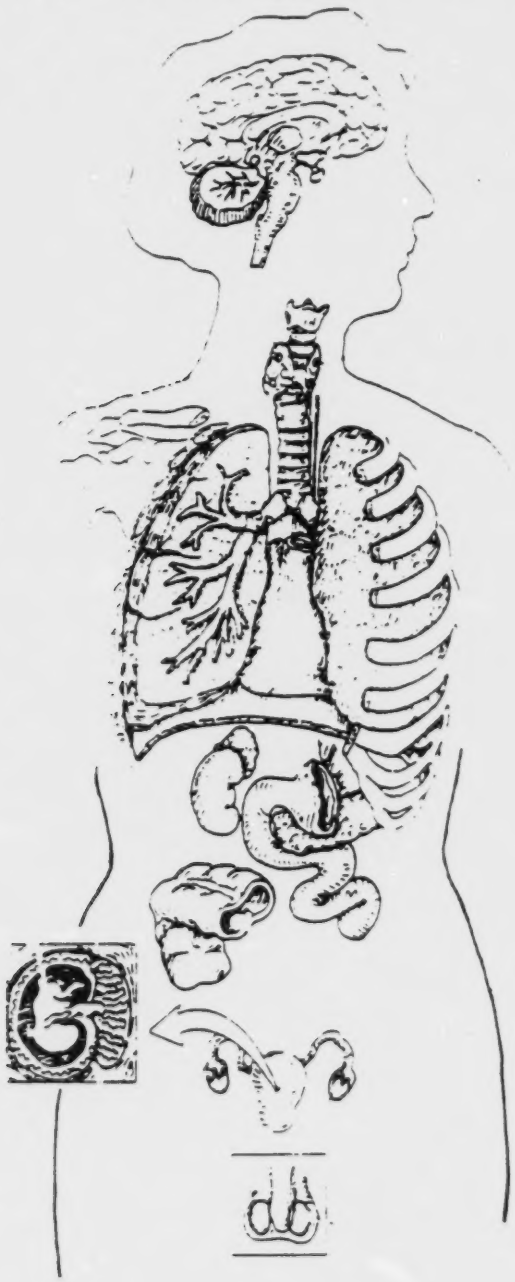
From MassCOSH Women's committee,
Our Jobs, Our Health, 1983

Where Can Lead Be Stored And Cause Damage

Name _____

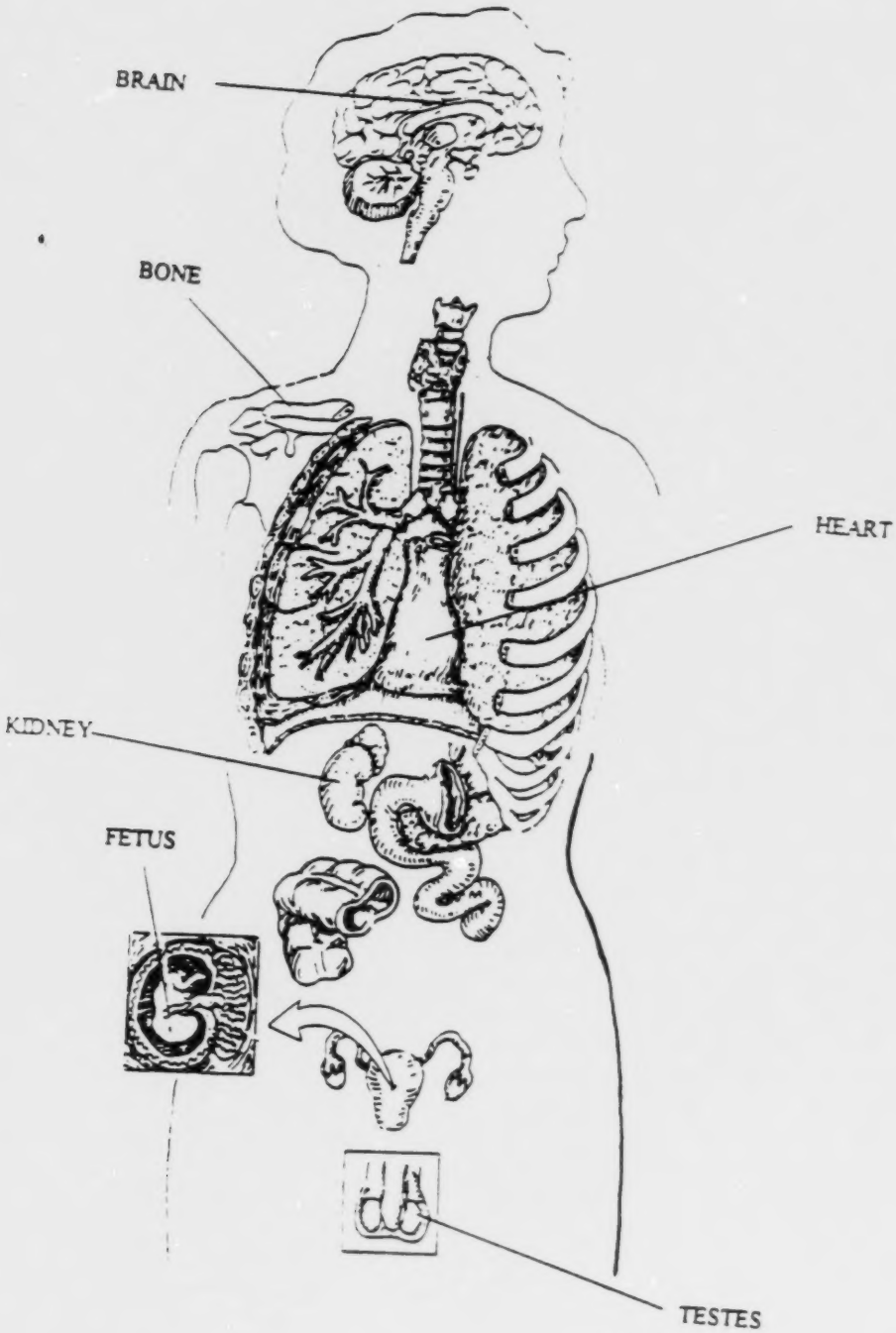
DON'T BE A LEADBELLY WORKSHEET

Directions: Pinpoint (label) the places of lead storage and damage in the drawing.



DON'T BE A LEADBELLY WORKSHEET

ANSWER KEY



ARE CHILDREN AT A GREATER RISK OF LEAD POISONING?

Children are more susceptible to lead poisoning than adults.

- A child's rapidly growing body is greatly affected by lead levels, especially brain and nervous system.
- A child's hand-to-mouth behavior increases exposure to lead
- A child absorbs more nutrients than adults so their mineral uptake is greater.

LEAD IS THE # 1 CHILDREN'S ENVIRONMENTAL ILLNESS, AFFECTING **15 %** OF ALL U.S. CHILDREN.

SYMPTOMS OF LEAD POISONING

LEVELS OF LEAD	HEALTH EFFECTS
Low Levels 10 - 35 ug/dL in children 10 - 40 ug/dL in adults	Usually no symptoms
Moderate Levels 35 - 50 ug/dL in children 40 - 60 ug/dL in adults	There may be no symptoms General fatigue Irritability Difficulty in concentrating Tremors Headaches Abdominal pain Vomiting Weight loss Constipation
High Levels Over 50 ug/dL in children Over 60 ug/dL in adults	There may be no symptoms or the symptoms may be those mentioned **Moderate Levels** above. Convulsions Paralysis Coma Death

HOW CAN A PERSON TELL IF HE/SHE HAS LEAD POISONING?

The only way to know for sure if a person has an elevated blood-lead level is to be tested for it. There are two tests to screen for lead levels and both methods require blood from a vein or from a pricked finger. The two tests are:

- Blood-lead Test- measures the actual amount of lead in the blood
- FEP or EP Test- measures a chemical that changes in response to lead exposure

The Centers for Disease Control recommends the Blood-lead Test as the first method of screening for lead levels. The CDC recommends that all children be tested at the age of 12 months and at 24 months. Screening should start at 6 months in children at-risk to lead exposure.

HOW TO INTERPRET BLOOD-LEAD LEVELS

To correctly interpret blood-lead levels, keep in mind the method used to draw the blood sample. Finger sampling tests can have surface skin contamination, making a higher level; a repeat test should be performed in a few months.

10-14 ug/dl. Even if the blood sample was drawn from a vein, it is difficult to interpret a single test result in the 10-14 ug/dl range. Many such test results will turn out to be false positives, and the test should be repeated in a few months. If the test results remains in this range, it indicates that your child has a higher blood-lead level than average. Obvious high dose sources of lead, such as peeling lead-based paint, should be addressed. However, the effect on the individual child of blood-lead levels in this range is very small.

15-19 ug/dl. If the test result is in the 15-19 ug/dl range and the sample was drawn from a finger, it is possible that surface skin contamination is making the level higher than average. A repeat test (preferably from a vein) should be performed within a month. Obvious high-dose sources, such as peeling lead-based paint, should be addressed. If the child's blood-lead level persists in this range over a three-month period, you may want to have an environmental assessment conducted to identify sources of exposure, if resources permit.

20-69 ug/dl. Children with blood-lead levels in this range should have a full medical evaluation. This includes a detailed environmental and behavioral history (asking about reading or other learning disabilities, language development, pica, etc.), a physical examination and tests for iron deficiency.

Over 70 ug/dl. Children with blood-lead levels this high are considered a medical emergency. Medical treatment and environmental action must begin immediately.

ARE THERE ANY WAYS TO REDUCE BLOOD-LEAD LEVELS ?

Proper diet and nutrition is one way to prevent any more lead from being absorbed into the body. Lead tends to be absorbed into the body easier on an empty stomach and where iron and calcium are lacking. Foods rich in calcium and iron help protect against lead absorption. Milk, yogurt, cheese, fish, vegetables (turnip tops, cabbage, collards, kale, broccoli, spinach, beet greens) and fruits (oranges, pineapple, raisins) provide calcium. Meat (beef, pork, chicken), cereal (iron-fortified), fish (clams, mussels, oysters, tuna, trout, cod, sardines and other fish), fruits (raisins, prunes, dates, and other dried fruits), eggs, liver and wheat germ provide iron.

ARE THERE MEDICAL TREATMENTS FOR LEAD REMOVAL FROM THE BODY?

Some children benefit from drugs that bind chemically with lead when blood levels are above 40 - 45 ug/dl; this process is called chelation. A doctor's guidance is needed here!

LESSON 5

GETTING THE LEAD OUT!

LEARNING OBJECTIVES

The learners will discover if their homes have been painted with lead based paint, have high lead levels in the water, or contain other products known to have high lead levels, AND what can be done about these problems.

INTRODUCTORY STATEMENT

In this lesson, students will become familiar with different basic lead abatement procedures. After they have learned about the different abatement procedures, they will survey their individual homes to determine possible lead levels.

MATERIALS

- Materials from the National Lead Information Center on lead removal and abatement (see Addendum)
- Enclosed surveys:
  Pb Wants to Know (Survey I – Paint)
  Pb Wants to Know (Survey II – Water)
  Pb Wants to Know (Survey III -- Health)

MANAGEMENT SUGGESTIONS

- Students will work alone and in groups.
- Estimated time: 3-5 forty-minute periods.
- Time needs to be allowed for getting surveys home and returned.
- CAUTION: Parents may not know details for surveys and may have to give an educated guess.
- If community presentations are made, significantly more time will be required.

PROCEDURE

- Present information on lead abatement procedures for paint. (See attached materials)

PROCEDURE, continued

- Hand out survey (Pb Wants to Know - Survey I - Paint) making sure students understand all parts of the survey.
- Line graph "yes" answers of survey and decide what should be done.
- Present information about lead abatement procedures for water and other products commonly found in the home. (See attached materials.)
- Hand out survey (Pb Wants to Know - Survey II - Water) making sure students understand all parts of the survey.
- Line graph "yes" answers of survey and decide what should be done.
- Hand out survey (Pb Wants to Know - Survey III - Health) making sure students understand all parts of the survey.
- Line graph "yes" answers of survey and decide what should be done.
- If surveys show possible lead problems, students can discuss ways to present this information to the community and/or younger grade levels.

DISCUSSION

After the surveys have been returned, the discussion needs to focus on what the results have shown and what should/could be done next.

- If the results show there is NOT a problem with either lead based paint or high lead concentrations in water, WHY is this? (new housing stock showing the effectiveness of recent government regulations limiting acceptable lead levels)
- If the results show there IS a problem with high lead levels in paint or in water, then the question becomes WHAT can be done next by the students.

If your house has lead-based paint, you should do the following short-term solutions:

1. **Regularly clean floors, window wells, window sills and other surfaces,** with a high-phosphate dishwasher detergent or trisodium phosphate (TSP), available in most hardware stores.

2. **Be alert to chipping and flaking paint.** Wash children's hands often, especially before they eat and before nap time and bad time.

3. **Make sure children eat well-balanced meals,** high in calcium and iron.

4. **Wash off bottles and pacifiers after they fall on the floor. Wash toys and stuffed animals regularly.**

5. **Make sure children do not chew on window sills or other surfaces covered with lead-based paint.**

6. **Don't bring lead dust into your home.** Children should play in sandy or grassy areas rather than dirt. Be sure children wash their hands when they come inside.

7. Get lead out of your drinking water. Have your water tested. If your water has lead, let it run for 30-60 seconds before drinking it or using it to cook. Do not drink, cook, or make baby formula from the hot water tap.

8. **Don't remove lead paint yourself.** These activities can create large amounts of lead dust that can remain long after the work has been completed. Hire a person with special training to remove lead paint from your home.

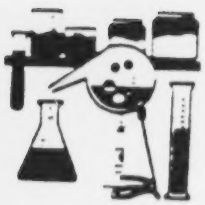
EXTENSIONS

Many of these extension activities will apply **IF** there appears to be a problem with lead in your community from the results of the survey OR from what you know about the age of the housing stock in your school community or in other parts of your town or city. Classes could consider presentations to the school administration, PTA, school district, city council or any other appropriate groups.

Social Studies (if other parts of lesson were done in science)

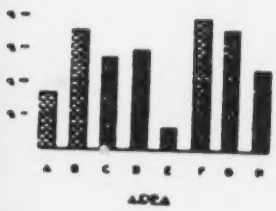
- Discussion or debate could be held on what it means to be a good citizen in a community and the responsibility to further educate the community about the dangers of lead.
- Students could write or telephone local government offices to see how local water supplies are tested for lead and what is done with those results.

Science (if other parts of lesson were done in social studies)



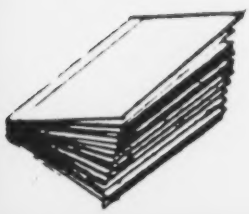
- Students could interview a custodian in the school to find out when the school was last painted and if, and how, the school's water is tested for lead. They could even watch or participate in the water testing.
- Students could investigate local building codes and local real estate title transfer regulations dealing with lead in both paint and water.

Math



- If community presentations are planned, math classes could prepare the graphs and charts for the presentations preferably with the aid of the computer teacher so the graphics would appear very professional.

Language Arts



- If community presentations are planned, language arts classes could plan, practice and implement these activities.

EXTENSIONS, continued

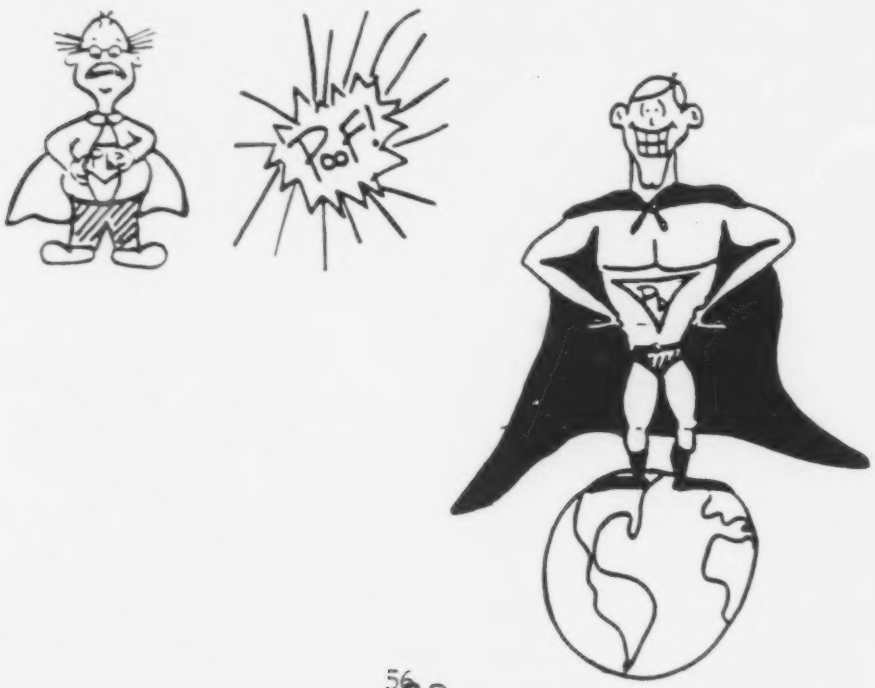
- If your community has a community access cable TV station, classes could work on and produce a TV program dealing with the history of lead & hazards of lead in the community.

Other

- 6th, 7th, or 8th grade students can prepare a presentation for a younger grade level on the hazards of lead in their community.
- Have student groups write one of the eight short-term solutions for a house with lead-based paint on a large piece of butcher paper or poster board and illustrate the solution. When all eight solutions have been illustrated, they may be displayed in the school or a local community center. Individual students may do the same activity on smaller paper and take home for display.

ASSESSMENT

- Students will complete the three attached surveys.



NATIONAL LEAD INFORMATION CENTER

TESTING YOUR HOME FOR LEAD

29. Who should do the testing?

Testing to determine the presence of lead in paint, dust, water, and soil is best done by trained professionals. Contact your local public health organization for information on lead inspection services and testing laboratories in your area. Other community organizations may be able to provide information or referrals for inspection services.

30. How can the paint in my home be tested for lead?

To thoroughly analyze the paint in your home, each different painted surface should be tested. Different paints may have been used on walls, window frames, doors, and so on. Paints may also differ from room to room. Each of your home's painted surfaces, both inside and outside, should be tested separately.

Professional testing companies use two basic methods to measure lead in paint:

- X-ray fluorescence (XRF) uses portable detectors that X-ray a painted surface to measure the amount of lead in all the layers of paint. This type of testing is done in the home and disturbs little, if any, paint.

- Laboratory testing of paint samples involves removing samples of paint from each surface to be tested, usually from an area of about two square inches. Samples are sent to laboratories for analysis. This methods leaves a bare spot where each sample is taken.

31. Are there any home test kits I can use for lead testing?

Do-it-yourself testing kits are commercially available. These kits do not tell you how much lead is present, however, and their reliability has not been determined. Professional testing for lead in paint is recommended over the do-it-yourself test kits.

32. How can the dust in my home be tested for lead?

Household dust may contain tiny particles of lead released from lead-painted surfaces inside the

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[2] OSHA and NIOSH are in the process of reevaluating health data as they relate to the construction standards. OSHA will issue a revised lead in construction standard shortly.

home or tracked in with lead-contaminated soil from outside.

The recommended sampling method for dust is the surface wet wipe. Dust samples are collected from different surfaces, such as bare floors, window sills, and window wells. Each sample is collected from a measured surface area using a wet wipe, which is sent to a laboratory for testing.

33. How can my water be tested for lead?

Household drinking water may contain lead, usually from old pipes that contain lead or from lead solder in plumbing.

Water samples can be collected directly from the faucet. Two samples are usually collected. One sample is taken from water that has been standing in the plumbing lines overnight or for eight hours or longer, and a second sample is taken after letting the water run for several minutes to flush the lines. The water samples are then sent to a laboratory for analysis.

34. How can the soil around my home be tested for lead?

Lead may be present in the soil around your home and near streets and highways close to your home.

To test soil for lead, samples are taken from areas near your home where children play and from areas that contain soil likely to be tracked into your home. The soil samples are sent to laboratories for analysis.

RENTAL UNITS, PUBLIC HOUSING, SECTION 8 HOUSING

35. I live in an apartment. Does my landlord have responsibility to remove lead-based paint from my apartment?

If you have a child under six who has a blood-lead level of 20 µg/dL or more, your landlord may be required to take certain actions. Laws and regulations vary according to the jurisdiction in which you live.

Learn about proper lead abatement yourself so that you can make sure whoever does the work is doing it correctly. (See Hazard Reduction and Abatement section.)

36. I live in a public housing project. Does the housing authority have to do anything about lead-based paint?

If you live in a development which was built before 1978, the housing authority should have given you a brochure telling you that the property may contain lead-based paint. The brochure describes the hazards of lead-based paint, the symptoms and treatment of lead-poisoning, and the advisability and availability of blood-lead levels screening for children under seven years[3] of age. If you did not get this brochure, ask for one.

If your child has an elevated blood-lead level of 25 µg/dL[4] or more, the housing authority must test your apartment within five days after being notified by your doctor or community health service of your child's high blood-lead level. If lead-based paint hazards are found during testing, the housing authority must tell you where the hazards are located. The housing authority must also treat[5] those surfaces where lead hazards are found within 14 days. If the housing authority is unable to treat the hazardous lead surfaces, then the housing authority must either move your family into a unit that was previously treated or one that was built after 1978.

The housing authority must protect residents while lead paint removal work is in progress. Often the housing authority must move you to another apartment while it does this work in your apartment. When "debris, fumes, or dust are going to be created" during lead paint removal, which almost always happens, the housing authority must move residents to another unit until the work and cleanup are completed.

37. I live in housing subsidized under the Section 8 rental certificate or rental voucher programs. Does my landlord have to do anything about lead?

Yes, if your home was built before 1978 and your family includes a child under the age of seven years[6]. If you have a Section 8 certificate or voucher, the inspector hired by the public housing authority must look for chipping, peeling, or loose paint during the initial and periodic

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[3] HUD is currently revising its regulations to address children "less than six years of age" to conform to Title X, the Residential Lead-Based Paint Hazard Reduction Act of 1992.

[4] HUD is currently revising its regulations to incorporate a new definition of elevated blood-lead level, which is 20 µg/dL in a single test or 15-19 µg/dL in two consecutive tests several months apart. These revisions are based on recent CDC research and recommendations.

[5] Treatment means either in-place management or actual abatement.

[6] HUD is currently revising its regulations to address children "less than six years of age" to conform to Title X, the Residential Lead-Based Paint Hazard Reduction Act of 1992.

inspections. If such paint is found, it must be removed or covered before the unit can be approved under the Section 8 program. If chipping, peeling, or loose paint is found during periodic inspections, the corrections must be made within thirty days of the public housing authority's notification to the owner.

If you have a child under the age of seven[7] living in a Section 8 unit who has a blood-lead level of 25 µg/dL[8] or more, you should present evidence of this to the housing authority. The housing authority must have the unit tested for lead. If the test results show that a chewable[9] surface is painted with lead-based paint, the owner must remove or cover the paint.

HOME REPAIRS AND RENOVATIONS

38. I'm planning to repair/renovate my house. What precautions should I take to protect myself and my family?

Before you disturb a surface with old paint on it, you should, if possible,

- Call your local health department and ask if they can test your home for lead-based paint. If the health department cannot test, ask them who can.
- If lead-based paint is found in your home, have the repair or renovation done by a worker who has been trained to protect your family and home from exposure to lead dust and chips.

In areas of your home where you know or suspect there is lead-based paint, you should avoid the following activities:

- scraping, sanding, or using a heat gun on painted surfaces before repainting;
- making holes in walls to get at pipes or install electrical outlets;

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[7] HUD is currently revising its regulations to address children "less than six years of age" to conform to Title X, the Residential Lead-Based Paint Hazard Reduction Act of 1992.

[8] HUD is currently revising its regulations to incorporate the new definition of elevated blood-lead levels which is 20 µg/dL in a single test or 15-19 µg/dL in two consecutive tests several months apart. These revisions are based on recent CDC research and recommendations.

[9] Chewable surfaces are defined as all chewable protruding painted surfaces up to five feet from the floor or ground, which are readily accessible to children under seven years of age (e.g., protruding corners, windowsills and frames, doors and frames, and other protruding woodwork).

- teaning out walls;
- repeatedly bumping furniture or other objects into painted walls;
- unnecessarily opening and closing windows with painted frames and sills.

If you must do repairs or renovations yourself in areas where you know or suspect lead-based paint is present, you should take the following steps:

- Move children and pregnant women to another apartment or house until work is completed and the area is properly cleaned.
- Cover exposed areas. If the area is small, such as an electrical outlet, keep that area covered until repair and cleanup are completed. If the area being worked on is large, such as a wall being torn down, use plastic coverings to seal off entrances and ducts and to protect furniture, carpets, rugs, and floors from paint dust and chips. Dispose of the plastic carefully.
- To keep the dust down, wet painted surfaces before you work on them.
- Clean up thoroughly. (Refer to question 39 for more information on cleaning up after a home repair or renovation is completed.)
- Avoid sweeping or vacuuming the work area. Sweeping spreads lead dust around. Vacuuming also spreads lead dust around, since tiny lead particles can pass through and out of ordinary vacuum cleaners.

39. **I've done work in my house that may have disturbed lead-painted surfaces. How should I clean up the house?**

If repairs or renovations of areas you know or suspect contain lead-based paint have occurred, be sure to clean up thoroughly.

- Always clean up dust and chips with wet mops or rags soaked in a solution of trisodium phosphate (TSP) or phosphate-containing powdered dishwasher detergent and warm water. (Powdered dishwasher detergents are recommended because most have high phosphate contents. Most multipurpose household cleaners are not effective in cleaning up lead dust.) To avoid skin irritation when cleaning up with TSP or high-phosphate dishwasher detergent, wear protective gloves.
- Use two buckets—one for wash water and one for rinse water. Always wring dirty water into the wash water bucket.

- To prevent recontamination of cleaned surfaces, wash mops and rags thoroughly after each use. If this is not possible, or if you have already used the mops and rags several times, place them in plastic bags and dispose of them carefully.

40. I've just completed repairing/renovating my house and suspect that it contains lead-based paint. What should I do?

If repairs or renovations of areas you know or suspect contain lead-based paint have already occurred or are occurring in or around your home, you should do the following:

- Keep children away from paint dust and chips.

- Clean up all dust and chips with wet mops and rags. Pay special attention to floors and to window sills and window wells (where the bottom of the window sash rests when the window is closed).

- Close your windows if work is going on outside your home that may be scattering lead dust--for example, a neighbor scraping exterior paint. Using wet mops and rags, clean up any dust that has gotten into your home. (Refer to question 39 for more information on cleaning up after a home repair or renovation is completed.)

- Have your children under six years old tested for lead in their blood. To arrange for testing, call your doctor or your local health department.

LEAD REMOVAL AND ABATEMENT

41. I have lead-based paint in my home. What should I do?

It is important to know that improper removal of lead-based paint can create hazardous levels of lead dust and fumes. In areas of your home where you know or suspect there is lead-based paint, you should avoid activities such as scraping, sanding, or using a heat gun on a painted surface. Work should be done by professionals trained in how to protect themselves, you, your family, and the environment.

In addition, you should clean up any problem areas with flaking/chipping paint and lead dust. Use phosphate-containing automatic dishwater detergent or trisodium phosphate (TSP), which is available at hardware stores. Wet mop and wet dust once a week with a solution of warm water and powdered automatic dishwasher detergent or TSP to keep lead dust down. Also, keep your children away from any areas with chipping or peeling paint.

42. What is involved when a trained professional removes lead-based paint from my home?

The contractor should be responsible for ensuring that your home is not contaminated with lead dust. He or she should seal off the work area with plastic, seal cabinet doors and drawers, and cover the floors with plastic. Furniture should be pulled into the middle of the room, covered with heavy plastic, and sealed to the floor with duct tape. Belongings such as kitchen items, personal items (e.g., toothbrushes, towels, linens), clothing, and children's toys should be packed away to avoid contamination.

No one (especially children and including pets) except trained workers should go into the house while the lead paint is being disturbed in any way. Alternative housing arrangements will need to be made for the time it will take to reduce lead hazards. Do not return until proper clean-up has been completed. To clean up, the contractor should use a special vacuum (called a HEPA vac) and a high-phosphate cleaning solution.

43. What is encapsulation?

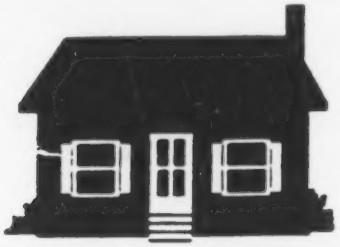
Encapsulation refers to resurfacing or covering lead-painted surfaces and sealing or caulking them with durable materials. This approach helps prevent chalking and flaking of substances that contain toxic levels of lead from becoming part of house dust or accessible to children.

44. How much does removal of lead-based paint cost?

The cost of removal depends greatly on how much lead is originally present and what actions are taken. If the removal involves only windows and some trimwork, the cost may not be too great. However, if more extensive work is required, the costs will be considerably higher.

HOME REPAIRS AND RENOVATIONS: WHAT YOU SHOULD KNOW ABOUT LEAD-BASED PAINT

Any house or apartment built before 1978 may contain lead-based paint. Most homes built before 1960 contain lead-based paint. Lead-based paint produced before 1960 contains higher concentrations of lead than paint manufactured in later years.



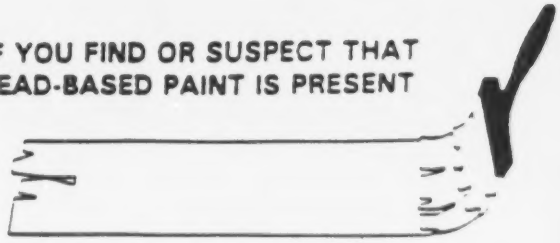
Lead-based paint can be on walls, ceilings, woodwork, windows, and sometimes floors. When lead-based paint on these surfaces is broken, sanded, or scraped, it breaks into tiny, sometimes invisible, pieces that your child may swallow or inhale. Even small repair and renovation jobs, including repainting projects, can create enough lead dust and chips to harm your child.

BEFORE YOU REPAIR OR RENOVATE

BEFORE you disturb a surface with old paint on it, you should, if possible,

- Call your local health department and ask if they can test your home for lead-based paint. If the health department cannot test, ask them who can.
- If lead-based paint is found in your home, have the repair or renovation done by a worker who has been trained to protect your family and home from exposure to lead dust and chips.

IF YOU FIND OR SUSPECT THAT LEAD-BASED PAINT IS PRESENT



You should AVOID the following activities, which can produce paint dust and chips, in areas of your home where you know or suspect there is lead-based paint:

- scraping, sanding, or using a heat gun on painted surfaces before repainting;
- making holes in walls to get at pipes or install electrical outlets;
- tearing out walls;
- repeatedly bumping furniture or other objects into painted walls;
- unnecessarily opening and closing windows with painted frames and sills.

If you must do repairs or renovations yourself in areas where you know or suspect lead-based paint is present, you SHOULD

- Move children and pregnant women to another apartment or house until work is completed and the area is properly cleaned.
- Cover exposed areas. If the area is small, such as an electrical outlet, keep that area covered until repair and cleanup are completed. If the area being worked on is large, such as a wall being torn down, use plastic coverings to seal off entrances and ducts and to protect furniture, carpets, rugs, and floors from paint dust and chips. Dispose of the plastic carefully.

The National Lead Information Center is operated by the National Safety Council with funding from the Environmental Protection Agency, the Centers for Disease Control, the Department of Housing and Urban Development, and the Department of Defense.

- To keep dust down, wet painted surfaces before you work on them.

- Clean up thoroughly.

  - Always clean up dust and chips with wet mops or rags soaked in a solution of trisodium phosphate (TSP) or phosphate-containing powdered dishwasher detergent and warm water. (Powdered dishwasher detergents are recommended because most have high phosphate contents. Most multipurpose household cleaners are not effective in cleaning up lead dust.) To avoid skin irritation when cleaning up with TSP or high-phosphate dishwasher detergent, wear protective gloves.

  - Use two buckets--one for wash water and one for rinse water. Always wring dirty water into the wash water bucket.

  - To prevent recontamination of cleaned surfaces, wash mops and rags thoroughly after each use. If this is not possible, or if you have already used the mops and rags several times, place them in plastic bags and dispose of them carefully.

- Avoid sweeping or vacuuming the work area. Sweeping spreads lead dust around. Vacuuming also spreads lead dust around, since tiny lead particles can pass through and out of ordinary vacuum cleaners.

IF REPAIRS OR RENOVATIONS HAVE ALREADY OCCURED

If repairs or renovations of areas you know or suspect contain lead-based paint have already occurred or are occurring in or around your home, you should do the following:

- Keep children away from paint dust and chips.

- Clean up all dust and chips with wet mops and rags, as described above. Pay special attention to floors and to window sills and window wells (where the bottom of the window sash rests when the window is closed).

- Close your windows if work is going on outside your home that may be scattering lead dust--for example, a neighbor scraping exterior paint. Using wet mops and rags, clean up any dust that has gotten into your home.

- Have your children under six years old tested for lead. To arrange for testing, call your doctor or your local health department.

Name _____

Pb WANTS TO KNOW
(Survey I - Paint)

1. Was our house/apartment building built before 1960?

   _____

2. Were the inside walls/ceilings/woodwork painted before 1960? _____

3. Is there peeling or chipping paint anywhere in our house/apartment? _____

4. Do we regularly visit a house/apartment that has peeling or chipping paint?

   _____

5. Are we, or anyone we regularly visit, planning to renovate or remodel?

   _____

6. If "Yes" for #5, or if you think this will happen eventually in the future, how do we plan to remove the paint safely?

   _____

7. Do I have a brother, sister, housemate or friend who is being monitored or treated for lead poisoning?

   _____

8. Do we live near an active lead smelter, battery recycling plant, or other industries likely to release lead?

   _____

9. Do we have paint stored in our house, basement, or garage? _____

10. Do we have anyone in our household in any of these occupations and/or hobbies? If so, place an X next to the occupation or hobby.

OCCUPATIONS

____ plumbers/pipe fitters

____ auto repair persons

____ glass manufacturers

____ shipbuilders

____ printers

____ plastic manufacturers

____ lead smelters and refiners

____ police officers

____ steel welders/cutters

____ construction workers

____ rubber product manufacturers

____ gas station workers

____ battery manufacturers or recyclers

____ bridge, tunnel & elevated highway workers

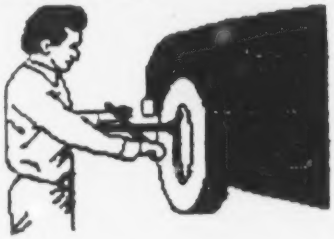
____ firing range instructors

____ lead miners

___ painters

____ none of the above

HOBBIES AND RELATED ACTIVITIES



____ glazed pottery making

____ target shooting at firing ranges

____ lead soldering (e.g., electronics)

____ painting

____ preparing lead shot, fishing sinkers

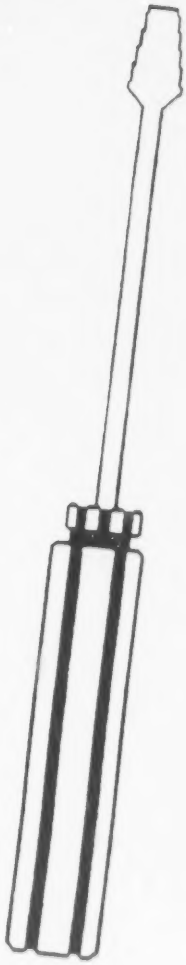
____ stained-glass making

____ car or boat repair

____ furniture refinishing

____ home remodeling

____ none of the above



Name _____

Pb WANTS TO KNOW
(Survey II - Water)

1. Do we have well water?

   _____

2. Was the plumbing in our house/apartment installed before 1988?

   _____

3. Do we live in a high-rise apartment building with lead-soldered central piping?

   _____

4. Do we have faucets or fittings made of brass?

   _____

5. Does our home or water system have lead pipes?

   _____

6. Does our home have copper pipes with lead solders?

   _____

7. Do we have naturally soft water?

   _____

8. If any of the previous answers were "Yes," then does our water sit in the pipes for six hours or longer before we use it?

   _____

9. If any of the previous answers were "Yes," do we use only water from the cold water tap for drinking, cooking, or making baby formula?

   _____

10. Have we ever had our water tested for lead?

    _____

Name _____

PB Wants to Know
(Survey III - Health)

Basically this survey will determine your understanding of some basic general health facts about lead. Pretend each sentence begins with "Is it true that..." Circle "Yes" or "No" for each item.

IS IT TRUE THAT:

1.	Lead cannot enter the body through your unbroken skin?	Yes	No
2.	Lead can affect the fetus?	Yes	No
3.	Children are at a greater risk for lead. poisoning than adults?	Yes	No
4.	Boiling water will not reduce its lead content?	Yes	No
5.	Lead does not degrade over time?	Yes	No
6.	You should never burn painted wood?	Yes	No
7.	You really should have a professional come in to safely remove lead paint in your home?	Yes	No
8.	If you must do the repairs or renovations yourself, then you should:		
	a. move children and pregnant women to another home.?	Yes	No
	b. cover exposed areas such as electrical outlets and entrances?	Yes	No
	c. clean up dust and chips with WET mop and rags?	Yes	No
	d. NOT vacuum rooms as you go along?	Yes	No
	e. use automatic dishwashing detergents that contain phosphates to clean up problem areas?	Yes	No

IS IT TRUE THAT:

9.	You should never use your teeth to bite off a lead sinker on a fishing line?	Yes	No
10.	Eating foods with high iron (e.g., cereal, fish, fruits eggs, lean red meat, and wheat germ) and calcium (e.g., dairy products, fish, vegetables and fruits) will help your body absorb less lead?	Yes	No
11.	Print on food storage bags, e.g., plastic bags for bread, should not come in contact with food?	Yes	No
12.	There are simple tests available so that you can find out the level of lead in your body?	Yes	No
13.	You can have lead poisoning without having any symptoms?	Yes	No
14.	Lead poisoning affects 15% of all children?	Yes	No
15.	Lead affects your circulatory, respiratory, and nervous systems?	Yes	No

Answer Key

PB Wants to Know
(Survey III - Health)

Basically this survey will determine your understanding of some basic general health facts about lead. Pretend each sentence begins with "Is it true that..." Circle "Yes" or "No" for each item.

IS IT TRUE THAT:

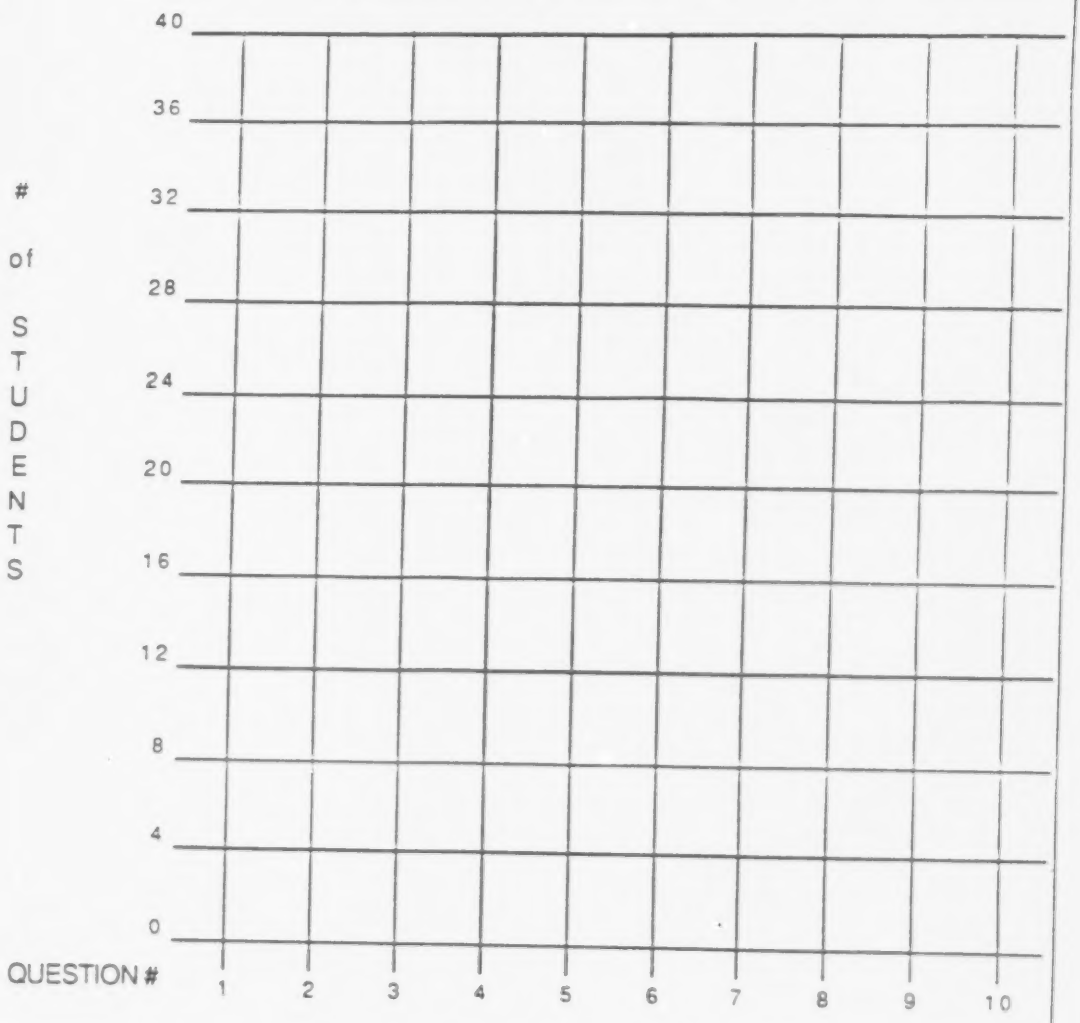
1. Lead cannot enter the body through your unbroken skin? (Yes) No
2. Lead can affect the fetus? (Yes) No
3. Children are at a greater risk for lead. poisoning than adults? (Yes) No
4. Boiling water will not reduce its lead content? (Yes) No
5. Lead does not degrade over time? (Yes) No
6. You should never burn painted wood? (Yes) No
7. You really should have a professional come in to safely remove lead paint in your home? (Yes) No
8. If you must do the repairs or renovations yourself, then you should:
   a. move children and pregnant women to another home.? (Yes) No
   b. cover exposed areas such as electrical outlets and entrances? (Yes) No
   c. clean up dust and chips with WET mop and rags? (Yes) No
   d. NOT vacuum rooms as you go along? (Yes) No
   e. use automatic dishwashing detergents that contain phosphates to clean up problem areas? (Yes) No

IS IT TRUE THAT:

9.	You should never use your teeth to bite off a lead sinker on a fishing line?	Yes	No
10.	Eating foods with high iron (e.g., cereal, fish, fruits eggs, lean red meat, and wheat germ) and calcium (e.g., dairy products, fish, vegetables and fruits) will help your body absorb less lead?	Yes	No
11.	Print on food storage bags, e.g., plastic bags for bread, should not come contact with food?	Yes	No
12.	There are simple tests available so that you can find out the level of lead in your body?	Yes	No
13.	You can have lead poisoning without having any symptoms?	Yes	No
14.	Lead poisoning affects 15% of all children?	Yes	No
15.	Lead affects your circulatory, respiratory, and nervous systems?	Yes	No

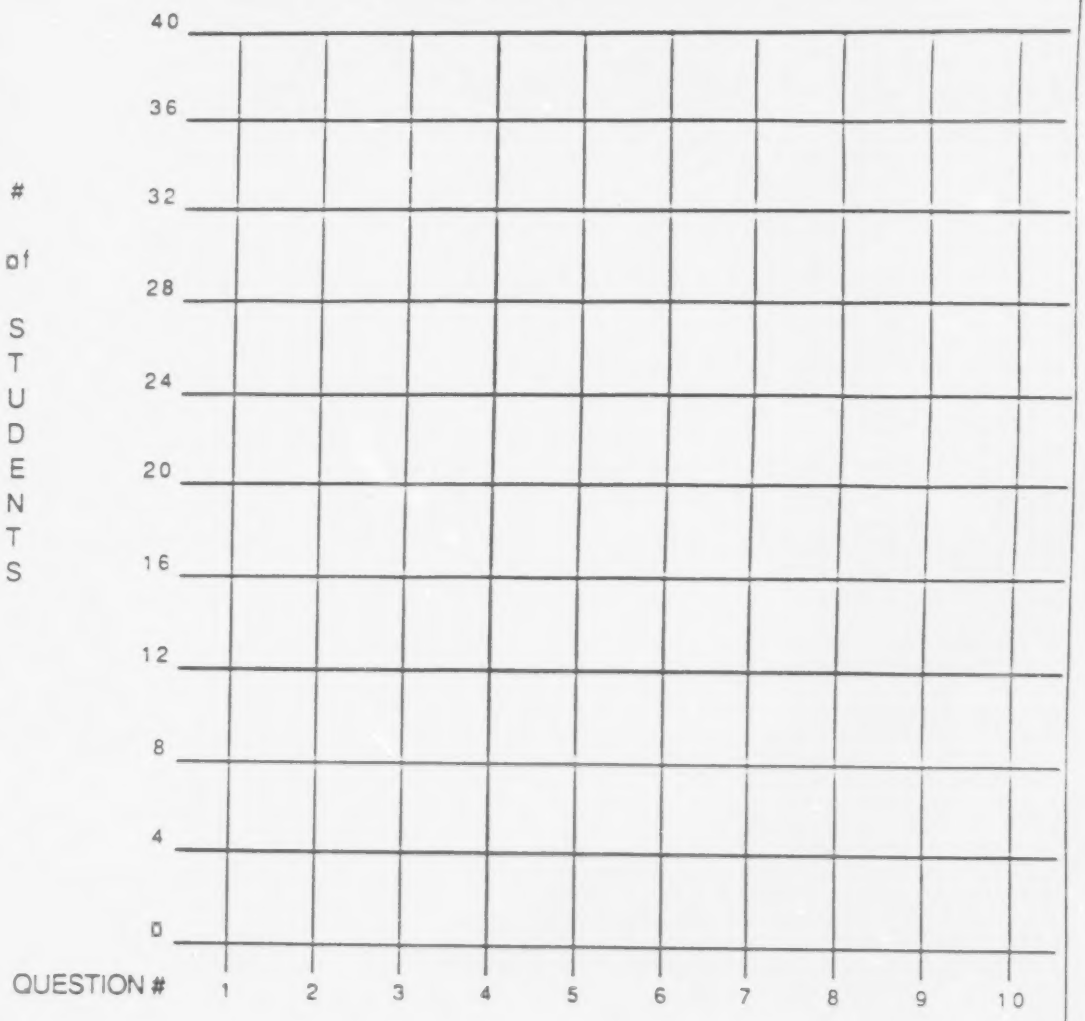
SURVEY I -- PAINT

Graph of YES Responses to Survey I



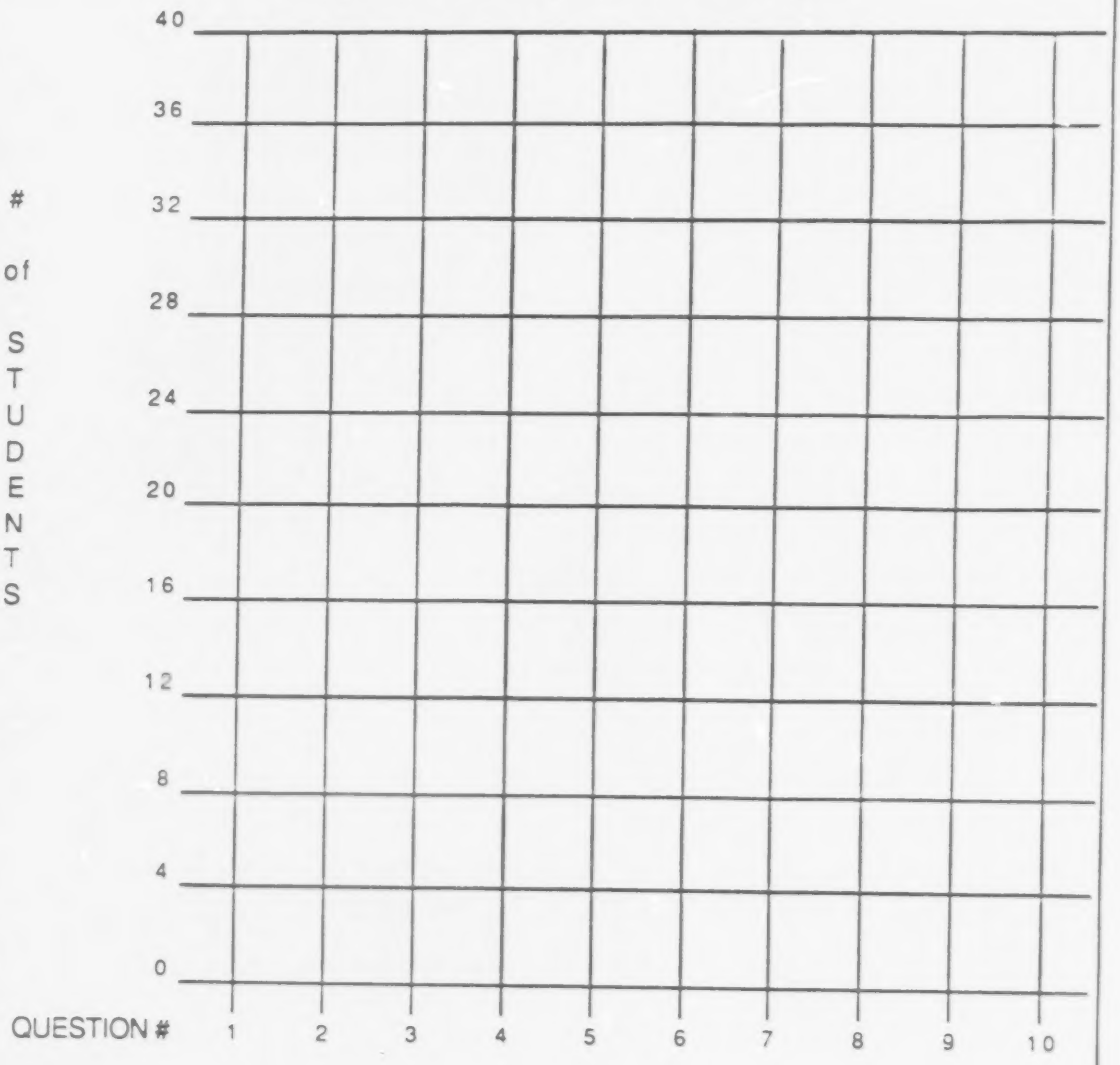
SURVEY II -- WATER

Graph of YES Responses to Survey II



SURVEY III -- HEALTH

Graph of YES Responses to Survey III



LESSON 6

FAMILY LEAD ALERT
STUDENTS AS TEACHERS

LEARNING OBJECTIVES

The learner will do a nutritional profile on their own families to see if they are using good nutritional practices as a way of preventing unnecessary lead absorption.

INTRODUCTORY STATEMENT

Students will use the information they have been learning in lessons 4 and 5 to teach their families some ways they can prevent unnecessary lead absorption.

MATERIALS

- Chart of foods rich in iron and calcium
- Family Nutritional Profile

MANAGEMENT SUGGESTIONS

- Two to three classes
- Family Nutritional Data Table should be duplicated for each family member.

PROCEDURE

- Use the information from Lesson 4 (p. 51) "Are There Any Ways to Reduce Blood-Lead Levels?" to instruct students on the role of proper diet and nutrition in lead absorption.

- Review with student what is meant by "pica behavior" (Working Vocabulary p. 2).

- Emphasize the importance of hand washing and washing around the mouth before eating to protect against lead absorption from soil

- Discuss the enclosed chart of Foods Rich in Iron and Calcium. Apply this information to foods eaten regularly and irregularly by their families.

DISCUSSION

- Discuss the importance of not "fasting" between meals when one is concerned about lead absorption.
- Hand students "Family Nutritional Data Table." Explain how they will be filling out a data table for each family member for a week. Answer questions about the profile.
- What have they learned about the eating habits and the nutritional practices of their families?
- What are concerns they have (if any) about family eating practices?
- How can they as students affect change in their family's diet?
- Have they ever noticed pica behaviors in any family members? If so, what can they do about it?

EXTENSIONS

- Continue the Family Nutritional Profile over a much longer period of time. Consider doing this the first week of every month for the entire year.
- Invite a nutritional expert to come speak to the students.
- Develop math activities that can chart and/or graph each family's nutritional profile.
- Use nutritional profile to chart student's own cafeteria food and snacks.

ASSESSMENT

- Students will be able to assess the level of their families' diet in nutritional terms and will be able to discuss ways the diet could be improved.
- Students will be able to create a poster or illustration showing good anti-lead eating habits vs. at-risk eating habits.

Name _____

FOOD PRODUCTS RICH IN CALCIUM AND IRON

Calcium Rich Foods	Iron Rich Foods
Milk Yogurt Cheese Fish Vegetables (turnip tops, cabbage, collards, kale, broccoli, spinach, beet greens) Fruits (oranges, pineapple, raisins)	Meat (beef, pork, chicken, liver) Cereal (iron fortified) Fish (clams, mussels, oysters, tuna, trout, cod, sardines and other fish Fruits (raisins, prunes, dates, and other dried fruits) Eggs Wheat Germ

INSTRUCTIONS:

1. Complete a nutritional profile for each member of your family.
2. Place a √ for each serving in the appropriate box.

_____ FAMILY'S NUTRITIONAL DATA TABLE

	Milk	Yogurt	Cheese	Fish	Selected Vegetables	Selected Fruits	Eggs	Iron Fortified Cereal	Eggs	Wheat Germ
Monday										
Tuesday										
Wednesday										
Thursday										
Friday										
Saturday										
Sunday										

3. On an average daily basis, how many hours between breakfast and lunch? _____ between lunch and dinner? _____

4. List snacks eaten regularly between meals.

FOOD PRODUCTS
RICH IN CALCIUM AND IRON

Calcium Rich Foods

Milk

Yogurt

Cheese

Fish

Vegetables (turnip tops, cabbage, collards, kale, broccoli, spinach, beet greens)

Fruits (oranges, pineapples, raisins)

Iron Rich Foods

Meat (beef, pork, chicken, liver)

Cereal (Iron fortified)

Fish (clams, mussels, oysters, tuna, trout, cod, sardines and other fish)

Fruits (raisins, prunes, dates and other dried fruits)

Eggs

Wheat Germ

Name _____

_____ FAMILY'S NUTRITIONAL PROFILE

FAMILY MEMBERS:

	Names	Ages
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____

FIVE NUTRITIONAL FACTS RELATED TO LEAD PREVENTION

1. _____
2. _____
3. _____
4. _____
5. _____

THREE EATING BEHAVIORS THAT CAN AFFECT LEAD ABSORPTION

1. _____
2. _____
3. _____

THREE CONCLUSIONS I HAVE REACHED FROM MY FAMILY'S NUTRITIONAL PROFILE

1. _____
2. _____
3. _____

LESSON 7

LEADing QUESTIONS

LEARNING OBJECTIVES

The learner will see that in addition to lead in water and paint, there are some other possible sources of lead in the environment, and what can be done to bring these to the attention of the proper authorities.

INTRODUCTORY STATEMENT

Students will do creative problem-solving regarding lead in their environments.

MATERIALS

- Previous materials used throughout this packet
- Attached worksheets
- Art supplies

MANAGEMENT

- Some activities suggested lend themselves to working alone, in pairs, or in groups.

- Two to three 40-minute periods if some activities are done in class.

PROCEDURE

- Present information and direct a discussion about "other" sources of lead in our environment. (See previous lessons.)

- Use any or all of the attached suggested activities at your discretion, to be done in class or as homework.

DISCUSSION

- Explain why PREVENTION of health-related lead problems is easier to deal with than the health problems themselves?

EXTENSIONS

The suggested activities which follow could be done in most classes:

- Write a PUBLIC SERVICE ANNOUNCEMENT for your local television or radio station including at least three facts you've learned about lead in your water (paint).
- Create a poster that could be placed in your community, e.g., near your school drinking water fountain, that declares this a "Lead-Free Zone."
- Write a guest editorial for your school or community newspaper that addresses one problem your area has regarding lead. Be sure to include suggestions for a healthy solution.
- Write a newspaper article about your activities during this unit, e.g., if you tested your school's water for lead and found it safe for drinking, then tell about that.
- Create a RAP that includes at least three lead-related problems and be sure to include solutions.
- Design a slogan for a bumper sticker or button that is an "attention grabber" about the hazards of lead.
- Create a cartoon using your knowledge about the dangers of lead and possible prevention.
- Create a collage of potential lead hazards and/or another of solutions to these problems.
- Investigate alternative methods of making stained glass.
- Write a story for an elementary student (you choose the grade level) in which you simplify one or two of the possible lead hazards a student may face in his/her environment.
- Combine all the information your class has learned about lead as a hazard in your community and make graphs into overheads for a school-wide assembly that you would conduct on this issue.

EXTENSIONS, continued

- Keep track of all community leaders and their addresses and create a list that can be distributed to others who may wish to write to these authorities about lead.
- Make a list of all expressions about lead, e.g., lead belly and lead foot, and make up a story about how each expression was created.
- Create a myth about lead. Use any information in this unit, go back in time or make it a "modern" myth, but be sure to include facts about lead (heavy, bluish-gray, malleable, toxic).
- Discuss the attached "lead" quotations.
- Create your own stained glass and discover the hidden message. (See attached.)
- Older students could make anti-lead buttons to give to younger students.
- Older students could work with younger ones on a poster, cartoon, or rap.
- Younger students could dictate letters or essays to older students who could then proofread these items.
- Add your own ideas here!

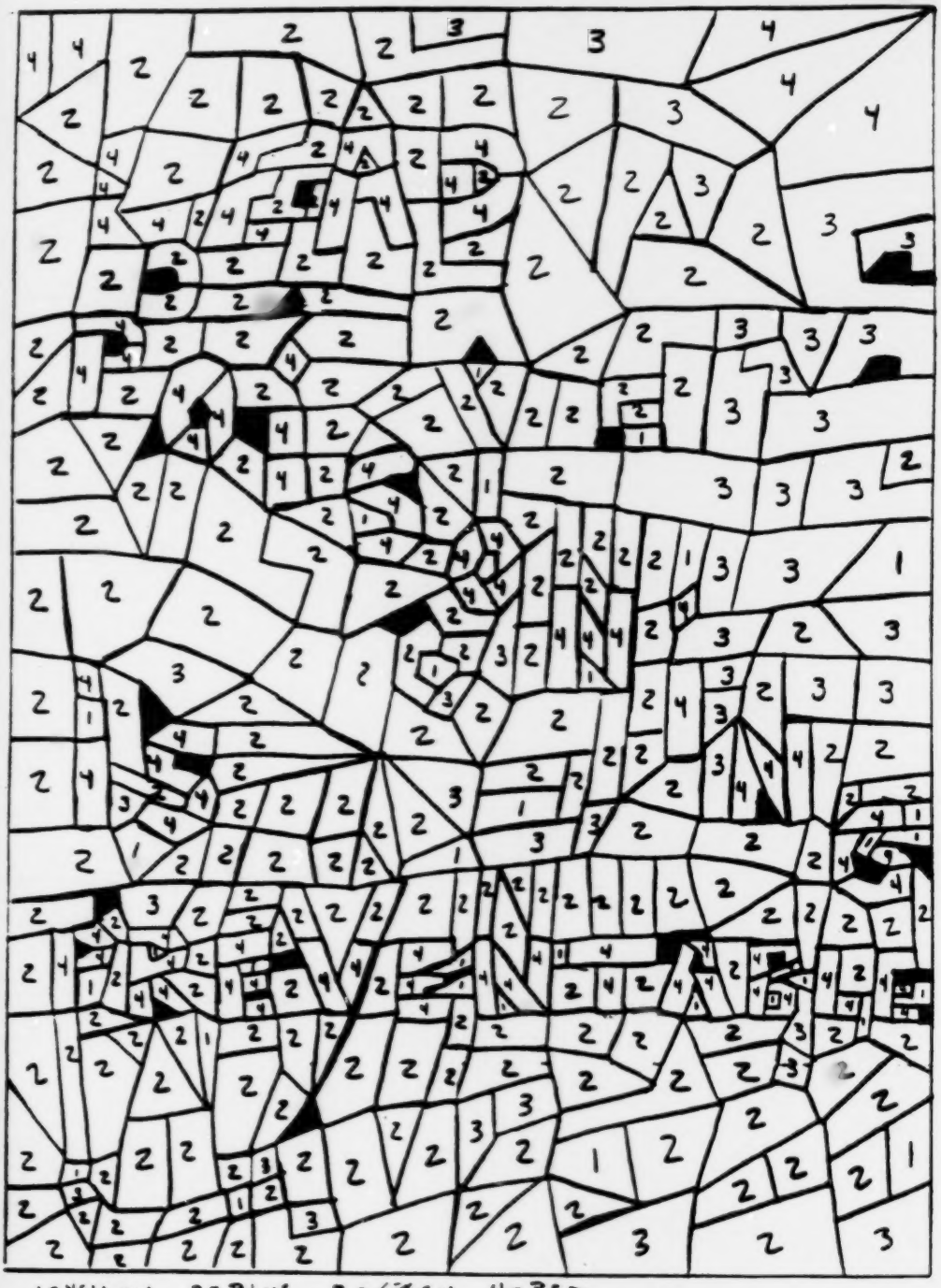
ASSESSMENT

- Students will list ten facts that they now know about lead that they didn't know when they started this unit.

Name _____

LESSON 7

LEADing QUESTIONS STAINED GLASS



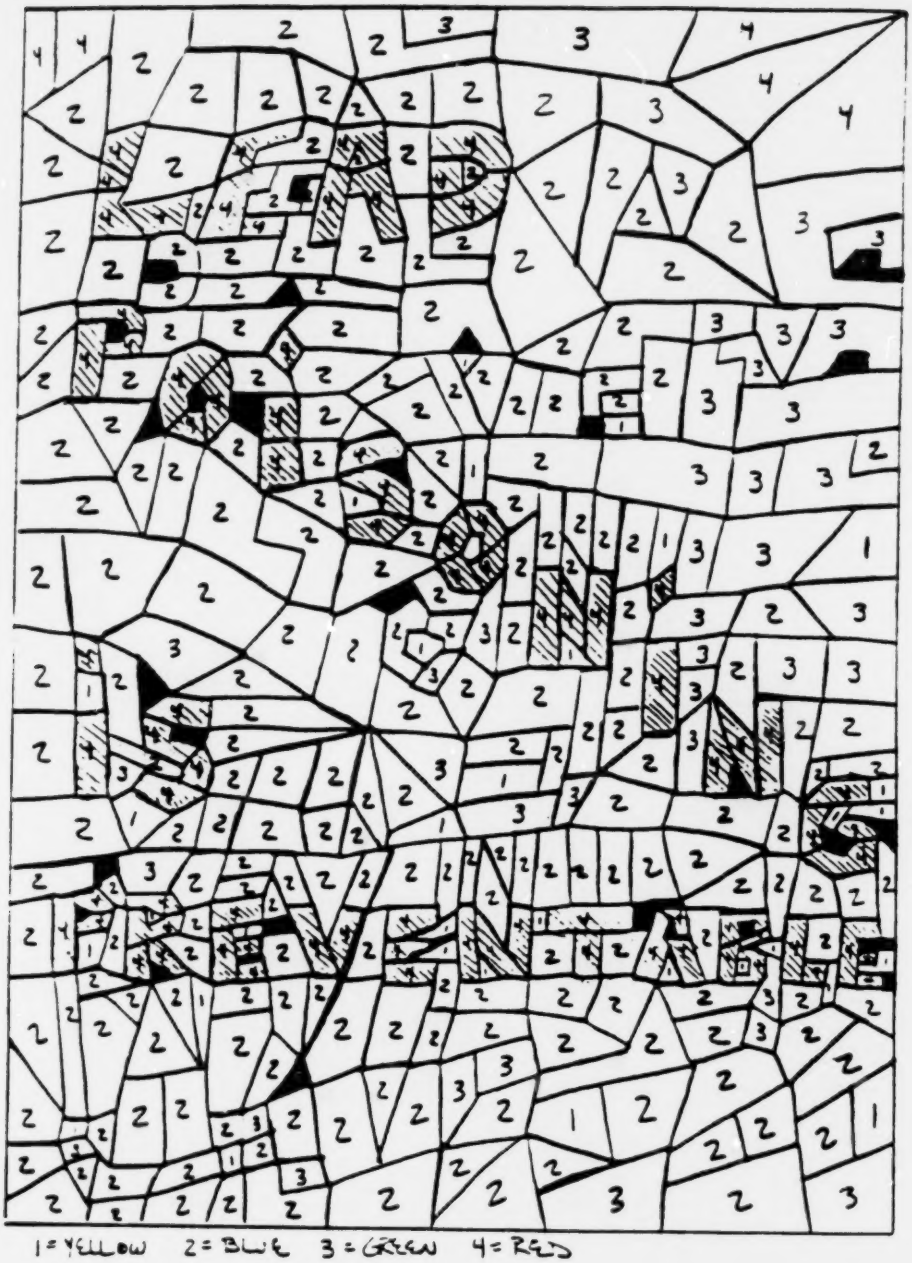
1 = YELLOW 2 = BLUE 3 = GREEN 4 = RED 85

Name _____

LESSON 7

LEADing QUESTIONS STAINED GLASS

ANSWER KEY



LEAD QUOTATIONS

"Hot lead can be almost as effective coming from a Linotype as from a firearm."
[John O'Hara (1905-1970) The Portable F. Scott Fitzgerald. Introduction, 1945].

"A brain of features, and a heart of lead."
[Alexander Pope (1688-1744) The Dunciad Book II, line 44, 1728-1743].

"King Pandion, he is dead,
All thy friends are lapped in lead."
[Richard Barnfield (1574-1627) Poems: In Divers Humours Ode (1598)].

"The gray -green stretch of sandy grass,
Indefinitely desolate;
A sea of lead; a sky of slate;
Already autumn in the air, alas!"
[Arthur Symons (1865-1945) Color Studies (1895). At Dieppe.]

"Thou are a soul in bliss; but I am bound
Upon a wheel of fire, that mine own tears
Do scald like molten lead."
[William Shakespeare (1564-1616) King Lear, IV, vii, 46].

"I am the voice of today, the herald of tomorrow...I am the leaden army that conquers the world -- I am TYPE."
[Frederic William Goudy (1865-1947) The Type Speaks].

Night, sable goddess! from her ebon throne,
In rayless majesty, now stretches forth
Her leaden scepter o'er a slumbering world."
[Edward Young (1986-1765) Night Thoughts I, l. 18].

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The Nature and Extent of Lead Poisoning in the United States: A Report to Congress, Agency for Toxic Substances and Disease Registry (ATSDR), 1988.

NIOSH Alert: Request for Assistance in Preventing Lead Poisoning in Construction Workers. National Institute for Occupational Safety and Health (NIOSH), August 1991.

Nutrition during Pregnancy and Postpartum Period -- A Manual for Health Care Professionals. California Department of Health Services (CDHS), June 1990.

Preventing Lead Poisoning in Young Children. Pamphlet. Centers for Disease Control and Prevention, June 1990.

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Working with Lead in the Construction Industry, Occupational Safety and Health Administration (OSHA), April 1991.

THE LEAD DETECTORS

(A mystery regarding the dangers of lead.)

Authored by David Anderson
Music and lyrics by Joan Maute, Ed.D.
Music arrangement and keyboards by Jay Kellner
vocals by Shannon Duraski, Scott Gilchrist,
Megan Luke, Rebecca Melisi, and Doug Thompson
Poster by Bob Provost
Produced by Studio 2
Joan Maute Project Coordinator and Editor

This project was completed in collaboration with the University of Illinois-Chicago School of Public Health, Babette J. Neuberger liaison.

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PS 030132

Introduction

The Lead Detectors is intended to be listened to and/or performed by middle school students. It is a companion to *Let's Get The Lead Out*, an integrated learning unit on the dangers of lead. The curriculum, radio script, audio-tape, and a colorful poster are available free of charge from the U.S. EPA (see address below). Middle school students can take this very important information to local elementary school classes, day care centers, community centers, or parent-night meetings via a performance. The radio mystery/readers' theatre format allows the students to perform without scenery, props. costumes, or memorizing lines. The songs may be played from the tape using the recorded student voices, or performed by students using the musical accompaniment on side B. After the performance it would be very appropriate for the readers and/or singers to ask the audience for signs and dangers of lead poisoning and some preventative measures that can be taken to be "lead free."

You have permission to copy this unit for classroom/school use. For a copy of *Let's Get the Lead Out* please contact
U.S. EPA
attn: Publications
77 W. Jackson (P-19J)
Chicago, Illinois 60604
or in the Midwest, call: 1-800-621-8431

Get the Lead Out

CAST OF CHARACTERS

NARRATOR 1:	Serves as one of the announcers of the story
NARRATOR 2:	Serves as one of the announcers of the story
NARRATOR 3:	Serves as one of the announcers of the story
NARRATOR 4:	Serves as one of the announcers of the story
CHRIS:	One of the three Lead Detectors, a detective searching out the bad effects of lead
SAM:	Another of the three Lead Detectors, a detective searching out the bad effects of lead
FREDDY:	Another of the three Lead Detectors, a detective searching out the bad effects of lead
BILLIE:	The older of the two siblings who ask the Lead Detectors for help.
JO:	The younger of the two siblings who ask the Lead Detectors for help.
SPOT:	The pet of Billie and Jo
PROFESSOR:	Professor Plumbum, author of the book, Detecting and Correcting Uses of Lead, exists to quote lines of his book as the Lead Detectors consult him as a reference.

Get the Lead Out

NARRATOR 1: You better watch out!

NARRATOR 2: It could be in the water!

(sound of gurgling water)

NARRATOR 3: On the walls!

(sound of knocking)

NARRATOR 4: In the air

NARRATORS 1-4: Whoosh!

NARRATOR 3: In the pipes

(sound of clanging pipes)

NARRATOR 1: In the cans

(sound of cans together)

NARRATOR 4: In the glass

(glasses knocking together)

NARRATOR 2: In the paper

(paper ripping)

ALL: So you better be careful

NARRATORS 1 & 2: How you breathe

NARRATORS 3 & 4: What you swallow!

NARRATOR 1: Lead could be

ALL: Everywhere!

NARRATOR 2: You need to call

ALL: The Lead Detectors!!!

NARRATOR 3: The Lead Awareness Broadcasting System and [insert name of group]

NARRATOR 4: Take great pleasure

NARRATOR 1: In bringing you

NARRATOR 2: Another transcribed adventure of

ALL: The Lead Detectors!

NARRATOR 4: Starring:

CHRIS: Chris Wee

SAM: Sam Findet

FREDDY: And Freddy Goode

NARRATOR 3: Of the Lead Detective Agency:

CHRIS/SAM/FREDDY: Wee, Findet, and Goode

NARRATOR 1: This week's episode is entitled:

ALL: Get the Lead Out

NARRATOR 2: On one dreary afternoon in the offices of the Lead Detectors,

NARRATOR 4: A timid knock is heard on the front door

(knocking sound)

CHRIS: Come in.

FREDDY: Ah, it's two kids and their dog!

SAM: What can we do for you?

BILLIE: Hello.

JO: We have a mystery for you to solve.

CHRIS: A mystery?

ALL THREE: That's our job!

BILLIE: Our dog, Spot,

SPOT: Woof!

JO: Has been acting really strange lately.

FREDDY: What has he been doing?

BILLIE: He hasn't been hungry.

SPOT: (makes sad dog sounds)

JO: He's been irritable

SPOT: (slight groan)

BILLIE: He doesn't play anymore.

SPOT: (little yip)

JO: He even bit the mailman.

SPOT: (slight growl)

BILLIE: And all he does is sleeps all day!

SPOT: (falls asleep and snores)

BILLIE/JO BOTH: We want our old spot back!

SAM: Sounds like it could be a serious case of lead poisoning to me.

CHRIS: Could you show us an example?

BILLIE: Okay. Jo, wake up Spot there.

JO: Wake up, Spot.

ALL: Wake up!

SPOT: Woof! (sleepily)

BILLIE: Here, Spot, catch this ball.

SPOT: Woof! Woof! (getting more excited)

JO: Watch this.

BILLIE: Here you go!

ALL: Catch it, Spot!

SPOT: Ow!

ALL: Oh!

CHRIS: He missed it!

FREDDY: It hit him right on the nose.

SPOT: Ow!

JO: He used to be able to catch that ball all the time.

BILLIE: Now he just wants to sleep all day.

SPOT: (snoring again)

BILLIE: And Jo and I have been acting strange, too!

JO: We always get in fights now.

BILLIE: No, we don't!

JO: Yes, we do!

BILLIE: We don't!

JO: Do!

BILLIE: Don't!

JO: Do too!

BILLIE: Don't too! (if more humor is desired, a fake spitting at each other could be continued here)

CHRIS: Hey!

SAM: Both of you

FREDDY: Are irritable!

BILLIE/JO: Sorry!

JO: Can you help all three of us?

SAM: Sure thing, kid!

FREDDY: Okay, tell us, what have you done differently lately?

BILLIE: Well, we've gone to a different school.

JO: But Spot doesn't go to school with us.

BILLIE: And Jo is getting a D in English.

JO: Really, I was getting a B at my last school!

SAM: Hmmm, why have you changed schools?

BILLIE: Because we moved to a new neighborhood.

FREDDY/CHRIS/SAM: Ah!

CHRIS: And you moved into a new home?

JO: That's right!

FREDDY: How old is your house?

BILLIE: I don't know. But my parents had to paint all the dirty walls.

SAM: Sounds like we better check out your home.

CHRIS/FREDDY: That's right!

ALL THREE: "Lead" us to your home!

NARRATOR 1: So our brave detective trio follow

JO: Jo

BILLIE: Billie

NARRATOR 2: and their dog Spot

SPOT: Woof! (sleepily)

NARRATOR 3: To their home to solve

NARRATOR 4: The mystery of the House of Lead!

(During this, the group members could act like they are riding in a car.)

[Possible place for a commercial or a song.]

NARRATOR 1: As the Lead Detectors pull up to the mysterious

NARRATORS 1-4: House of Lead

NARRATOR 2: They immediately notice that the front door has

CHRIS: A stained glass window.

SAM: A rare specimen

FREDDY: Most definitely made over 40 years ago

CHRIS: And put together with

ALL THREE: LEAD.

JO: Is that bad?

FREDDY: Well, lead has many good uses.

CHRIS: It is an easily bendable metal that can protect people from x-rays and other harmful radiation.

SAM: Because it's so soft, it has good uses, such as

FREDDY: Tin cans

CHRIS: And batteries

CHRIS: And sinkers for fishing lines

SAM: And stained glass!

FREDDY: But it can also be negative if people get lead into their bodies.

BILLIE: Like being filled full of lead bullets?

CHRIS: Well, bullets are made out of lead!

SAM: But we're talking about other ways of getting lead in your body.

FREDDY: People can get lead in their bodies by

GROUP: Breathing lead

GROUP: And swallowing lead.

JO: I would never eat lead!

ALL: Yuck!

SAM: Well, Jo, you may not know that you're eating it.

CHRIS: And once lead is in your body, it is a toxic substance that can

FREDDY: Make you very sick,

BILLIE: Like Spot is feeling?

JO: And it's making us so irri-, irri-

BILLIE: Irritable! No wonder you're getting a D in English!

SAM: That's right. It could be the cause.

CHRIS: And it takes a long time

ALL: To get the lead out

SAM: Of your body!

FREDDY: And because your house is over forty years old.

CHRIS: According to the age of the stained glass window.

SAM: Your house could be full of lead hiding in all places!

CHRIS: Just like this stained glass window is being held together by lead

FREDDY: Lead could be used in other places in your house as well.

JO: And hurt poor Spot!

BILLIE: And us too!

JO: So, that explains my bad grade in English!

SAM: Let's start with where your dog eats.

BILLIE: Okay, here's where we give Spot fresh water and good food.

CHRIS: Let's examine the dog's bowls more closely.

JO: My grandmother brought those back from her vacation.

FREDDY: Hmmmm, a nice ceramic bowl with a clear glaze.

SAM: Let's turn it over.

(sound of splashing water)

CHRIS: Hey, these are new shoes!

FREDDY: See,

ALL THREE: Made in Mexico!

SAM: Let's consult Professor Plumbum's book of "Detecting and Correcting Uses of Lead."

FREDDY: Here it is, according to the professor . . .

PROFESSOR [as a separate voice giving advice]: Many dishes made out of ceramic, especially made in foreign countries, can contain lead. Some dishes may even have a glaze made out of lead.

BILLIE: So Spot could be getting lead in his system by eating out of these dishes.

JO: Billie, didn't grandma give us the same type of glasses with our names on them?

BILLIE: That's right!

JO: What do we do?

CHRIS: Simple, just replace these ceramic dishes with a dish that you know doesn't contain lead.

SAM: Such as stainless steel for Spot.

CHRIS: And glass or plastic for you two!

JO: Will we all be better then?

FREDDY: Well, let's examine this house more closely.

CHRIS: Look at what is placed under the dishes.

BILLIE: Yeah, it's the Sunday's funnies.

JO: Mom doesn't like Spot to get food and water all over her

GROUP: Clean

GROUP: Kitchen

ALL Floor.

SAM: Yes, but the professor has a good piece of information about colored newsprint.

PROFESSOR [continuing]: "Some colored inks, including those used on newsprint, contain lead."

BILLIE: Wow! I didn't know that.

JO: So, when Spot is being a good dog to clean up his food,

FREDDY: He could be picking up the lead from the ink on the newspaper.

BILLIE: That's easy! We won't put colored newspaper on the floor anymore.

CHRIS: And don't let the dog chew any funnies!

JO: Not even my Spiderman comics books!

SAM: And the professor even advises that

PROFESSOR: "Children should wash their hands after they have touched comics or comics books."

JO: I never knew that Spiderman could be so dangerous!

FREDDY: Next, we need to examine the water in this house.

CHRIS: Sam, do you have your handy dandy test kit for water.

SAM: I sure do, and it says that the water does contain high levels of lead.

BILLIE/JO: Oh, no!

BILLIE: What do we do?

FREDDY: Let's look in your basement.

BILLIE: Okay, right down here.

SAM: Look at these pipes.

CHRIS: Even though they are made of copper,

JO: Like pennies?

FREDDY: Yes, but the pipes are put together

SAM: Or soldered

ALL THREE: With lead!

CHRIS: According to the professor:

PROFESSOR: Lead was used as a common method for putting together the joints in pipes and in tin cans.

FREDDY: So, when the water sits in your pipes, the water gets high levels of lead in it.

JO: And I thought that only Colonel Mustard got hurt by lead pipes!

BILLIE: How can we solve this problem? My parents can't afford to put whole new pipes in the house.

SAM: There are many solutions.

CHRIS: Only use cold water for drinking or eating purposes.

JO: Why is that?

FREDDY: Hot water pipes will more likely dissolve the lead into the water.

SAM: And let the water run for a few seconds to clear out the old water before you fill your dog's bowl.

BILLIE: Or we could give Spot only pop to drink!

SPOT: Woof!

JO: For us too!

CHRIS: No, but you could use bottled water

FREDDY: Or filter the water you have.

BILLIE: Those sound like good solutions!

JO: We must be more careful what we drink!

SAM: And if this an old house, there's a good chance that we have to be careful with the walls.

BILLIE: Really?

CHRIS: Has Spot been chewing on any of the walls or eating paint chips?

JO: The window sill!

BILLIE: Here, look at this!

SAM: Looks like teeth marks.

FREDDY: This could be deadly!

BILLIE: I know. Dad almost killed Spot when he saw that!

CHRIS: No. Freddy means that many painted objects can be deadly.

SAM: Professor Plumbum has written that . . .

PROFESSOR: Many old paints used to contain high amounts of lead in them. And lead can be ingested in the body . . .

SAM: Through eating paint chips

GROUP: Yuck!

CHRIS: Rubbing against painted surfaces.

FREDDY: Or breathing dust from painted surfaces.

BILLIE: Wow, so that could explain Spot being so sluggish and irritable.

JO: And we could be breathing the dust too!

BILLIE: Which is why we have been so IRRITABLE Jo!

JO: What do we do?

SAM: Have your house's paint inspected.

CHRIS: There are professionals who can take care of the lead paint.

FREDDY: And don't ever chew on painted surfaces or eat paint chips.

ALL: Yuck!!!

SAM: And make sure mom or dad cleans the floors, window frames, window sills, and other surfaces weekly

CHRIS: With warm water and a general all purpose cleaner.

FREDDY: Also, you children should wash your hands often,

SAM: Especially before you eat and before nap or bed time.

BILLIE: We're too old for naps!

CHRIS: But your baby sister isn't.

FREDDY: And mom or dad should keep your baby sister's play area clean by washing her bottles, pacifier, toys and stuffed animals often.

SAM: If you take care of all these things, your dog and the both of you should be better in no time

BILLIE: And can we do anything to

GROUP: Get the lead out

JO: Of us?

CHRIS: It's a good idea to eat food with lots of calcium and iron

SAM: That should help chase out that lead very soon!

JO/BILLIE: Thanks, Lead Detectors.

CHRIS/SAM/FREDDY: Anytime, kids!

NARRATOR 1: And the Lead Detectors leave Billie, Jo, and Spot

NARRATOR 2: To take care of the house of lead.

NARRATOR 3: Soon to be unleaded!

NARRATOR 4: And remember kids,

NARRATOR 2: Be sure to

NARRATORS 1-4: Get the lead out!

NARRATOR 3: By being good lead detectors in your own houses.

NARRATOR 1: And eat foods rich in calcium and iron.

NARRATOR 4: Like Milk,

GROUP: Hmmmm

NARRATOR 2: Yogurt

GROUP: Yum

NARRATOR 1: Cheese

NARRATOR 3: And vegetables,

NARRATOR 2: And fruits

NARRATOR 4: And meats

GROUP: And fish!

NARRATOR 3: So that you can be healthy

NARRATOR 2: And free of lead

JO: And your dog too!

BILLIE: Catch, Spot!

SPOT: Woof!!

GROUP: Great catch

SPOT: (muffled, as with ball in mouth) WOOF!

SAM: Sign Spot up with the Cubs!

BILLIE: I love my dog and Jo too!

JO: I love you too Billie!

CHRIS: Friends again!

SAM: Doesn't it make you feel good to see such lead-free kids!

JO: And I'm getting an A in English now!

NARRATOR 1: Stay tuned for another

NARRATOR 4: Exciting

NARRATOR 3: Transcribed

NARRATOR 2: Adventure of . . .

ALL: The Lead Detectors!

Lead Rap
words and music by Joan Maute

We're the lead detectors and we're here to help you
'Cause keepin' you lead free is a thing we can do.
Lead can creep into your life and into your world.
It doesn't care if you're a boy or a girl.
So listen to us; hear what we're talkin' about
And together we'll keep or get the lead out!
get it out.....keep it out.....get it out.....keep it out

It can be in water comin' out of lead in pipes too;
It can be in paints and crayons things that little kids chew.

We're the lead detectors and we're here to help you
'Cause keepin' you lead free is a thing we can do.
Lead can creep into your life and into your world.
It doesn't care if you're a boy or a girl.
So listen to us; hear what we're talkin' about
And together we'll keep or get the lead out!
get it out.....keep it out.....get it out.....keep it out

You know air can get polluted from lead fumes or lead dust;
It can make you sick or cranky if you breathe it too much.

We're the lead detectors and we're here to help you
'Cause keepin' you lead free is a thing we can do.
Lead can creep into your life and into your world
It doesn't care if you're a boy or a girl.
So listen to us; hear what we're talkin' about
And together we'll keep or get the lead out!
get it out.....keep it out.....get it out.....keep it out

If lead gets in your body it gets in your bloodstream;
It travels through your systems gives you lead poisoning.

We're the lead detectors and we're here to help you
'Cause keepin' you lead free is a thing we can do.
Lead can creep into your life and into your world.
It doesn't care if you're a boy or a girl.
So listen to us; hear what we're talkin' about
And together we'll keep or get the lead out!
get it out.....keep it out.....get it out.....keep it out

You can help get the lead out be a lead detector too.
Spread the word, be alert, keep the lead out of you!

BEST COPY AVAILABLE

Come on; move it. Get the lead out!

Make it Lead Free
Words and Music by Joan Maute

Lead can make sick; lead can make you feel down.
So you need to watch whenever lead is around.
Here are some simple rules to keep in mind.
Don't you forget them; do them all of the time.

Make it lead free, keep it lead free.
Make it lead free, keep it lead free.

You need to clean your floors; clean your window sills too.
You need to clean that door where the paint's chipping through.
Just get a good detergent, get some water and see
How you can help yourself and family to stay lead free.

Make it lead free, keep it lead free.
Make it lead free, keep it lead free.

Watch your younger sisters; watch young brothers also
Don't let them chew paint blisters, help them by saying "no".
And when they drop their bottles or their toys onto the floor
Make them nice and clean and wash them once more.

Make it lead free, keep it lead free.
Make it lead free, keep it lead free.

Wash your hands real often, 'specially before you eat
Or when they get real dirty, or you're ready to sleep.
Eat a balanced diet; eat the food that will stick.
Let the water run; drinking it won't make you sick.

Make it lead free, keep it lead free.
Make it lead free, keep it lead free.

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